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A LONG-TERM FORECAST OF U.S. WATERBORNE FOREIGN TRADE

1976-2000 /

VOL. 1 SUMMARY

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November 1977

A LONG-TERM FORECAST
OF
U.S. WATERBORNE FOREIGN TRADE
1976-2000

Volume 1

Summary

U.S. Department of Commerce, Maritime Administration
Office of Policy and Plans
Division of Economic and Operational Analyses

November 1977

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ACKNOWLEDGEMENT

Although the contents of this report represent the combined efforts of all staff economists of the Division of Economic and Operational Analyses, individual recognition is merited by: Dr. H. C. Chung of the University of Bridgeport who directed the final production of the report; Mr. Russell Byington for its preparation and the development and estimation of the project's econometric "micro-models"; Dr. Panos Benetatos for the initial design of the micro-models; and by Thomas Hartman for the conceptual design, development, and implementation of data processing features of the trade forecasting system. In addition, appreciation is extended to Mrs. Josie B. Howarth for the secretarial support needed to produce the finished product.

Finally, thanks are due to those in industry and government whose comments and cooperation greatly facilitated the completion of the project.

FOREWORD

The forecasts presented herein have been prepared in light of Section 210 of the Merchant Marine Act of 1936 which makes it:

> . . . the duty of Secretary of Commerce to make a survey of the American merchant marine, as it now exists, to determine what additions and replacements are required to carry forward the national policy declared in section 101; . . . and . . . to study, perfect, and adopt a long-range program for replacements and additions to the American merchant marine . . . .

This report has been prepared for use by both industry and government planners interested in long-range foreign trade forecasting. For those wishing additional assistance regarding the report's methodology, data elements or general uses, please contact:

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Washington, D.C. 20230

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PART I INTRODUCTION

1.0 Introduction

This report describes a new development in the preparation of long-term trade forecasts that have been produced by the Maritime Administration to assist the Federal Government, the maritime industry, and related industries in their long-term policy and planning efforts. The forecasts presented herein will serve as the foundation of future trade forecasts that will be further refined to focus on both Government and industry planning needs in the realm of trade forecasting.

In this regard, the Maritime Administration has developed a foreign trade forecasting program that involves the compilation and dissemination of long-term forecasts of waterborne exports and imports utilizing the data that are available to Government and industry analysts in their pursuit of better ways to predict trends and future developments.

The forecasts produced in this three-volume report extend from 1976 to the year 2000, in five year intervals. All commodity export and import movements are in long tons.

The first volume of the report is a summary which includes the full description of forecasting models and procedures as well as highlights of forecasts for major import and export commodity groups. The second volume consists of computer printouts of forecasts of 3-digit Census Schedule A and B commodities by 19 world trading regions, and the third volume contains similar material classified by 65 major trade routes.

1.1 Purpose of Maritime Administration Trade Forecasting

Both Government and industry experience has adequately demonstrated the need for long-term trade forecasting which meets the needs of users to plan out the allocation of current and future resources. To this extent, the broad purpose of the forecasts presented in this report is to help the U.S. maritime industry take the steps to strengthen its position in U.S. and world commerce.

More narrowly, the purpose of this work involves satisfying the industry's need to constantly assess future requirements for merchant ships, shipyards and port facilities. Specifically, these trade forecasts are intended to aid in the following:

- Optimum deployment and utilization of existing vessels in the U.S.-flag fleet;
- Determination of the need for further increments to the U.S. fleet in terms of size and composition of ships to serve potential markets;
- Additional development and refinement of market share and penetration analyses;
- Estimation of new ship construction requirements and planned Government and industry resource allocations;
- Development of an orderly and well-thought out system of national ports;
- Evaluation and understanding of trade route operations;
- Estimation of U.S. and international demand for stevedoring and seagoing labor;
- Assessment and evaluation of the feasibility and soundness of current and future ship construction investments; and
- Planning and development of our maritime trade promotion efforts.

It is clear that these objectives emphasize a long-term future view and that timely and accurate data are needed to describe the changing resource base that the industry must allow for in making its plans. For this reason, the information developed and presented is geared to span several decades. The protracted useful life of ships and port facilities, plus the highly competitive nature of oceanborne trades, requires this extended outlook combined with the flexibility to constantly update market data essential for the promotion of U.S. commerce.

1.2 Micro-Model Forecasting Procedure

The trade forecasts presented in this report are based on a micro-model forecasting procedure that was developed within the Division of Economic and Operational Analyses. The approach combines simplicity and economy of operation with an ability to produce reasonably reliable forecasts because of its linkage to macro-economic data banks and forecasting models of Data Resources Inc., an internationally recognized econometric forecasting firm.

All forecasting models require adequate data systems. MarAd therefore maintains (in its Honeywell computer) a large amount of time series data on waterborne trade. In addition, time series for development of the micro-models are accessible in DRI data banks. DRI (Data Resources Inc.) is a Washington-based consulting firm which specializes in the maintenance of extensive economic data in its computer files and (highly sophisticated) econometric forecasting models constituting a national economic information system. It is accessed by several hundred private and public organizations who use it in their economic studies and forecasts, and who apply the answers developed by the model to drive satellite models of their own markets or of other micro economic variables needed for decisions.

Figure 1 shows the forecasting procedure used in forecasting the foreign trade included in this report (shown in solid lines), and also planned improvements shown in dotted lines.

Step 1: U.S. Bureau of Census annual tapes are acquired which store 354 time series, covering the period of 1967-75, on a 3-digit commodity level in Census Schedule A and B codes.

Step 2: Since many of trade volumes at the 3-digit commodity level are of minor quantity, these are grouped into 82 aggregated time series consisting of 41 imports and 41 exports. These then constituted dependent variables for micro models. (See Appendix E.)

Step 3: We have acquired the accessibility right to the DRI (Data Resource Inc.) data bank. This data bank contains, a wide variety of economic variables for both the U.S. and foreign countries. It has both past time series as well as forecasted series up to the year 1990. These DRI time series constituted independent variables in the micro models. (See Appendix G.)

Step 4: For each of the 82 commodities, the historical trade time series are correlated to the selected DRI data, and an econometric equation is devised. This led to the creation of 82 such equations in the form of multiple linear or log linear for each of 82 foreign trade commodity groups. These are the micro models. (See Appendix F for all equations.)

Step 5: The 82 micro models are used to forecast the amount of annual imports and exports up to the year 1990. Again, the independent variables were from DRI's data bank.

Step 6: Micro-model forecasts are checked against forecasts made by other sources such as U.S. Department of Agriculture, Bureau of Mines, and FEA.

Step 7: The forecasts are extended to the year 2000 by projecting the 1980-90 growth rate.

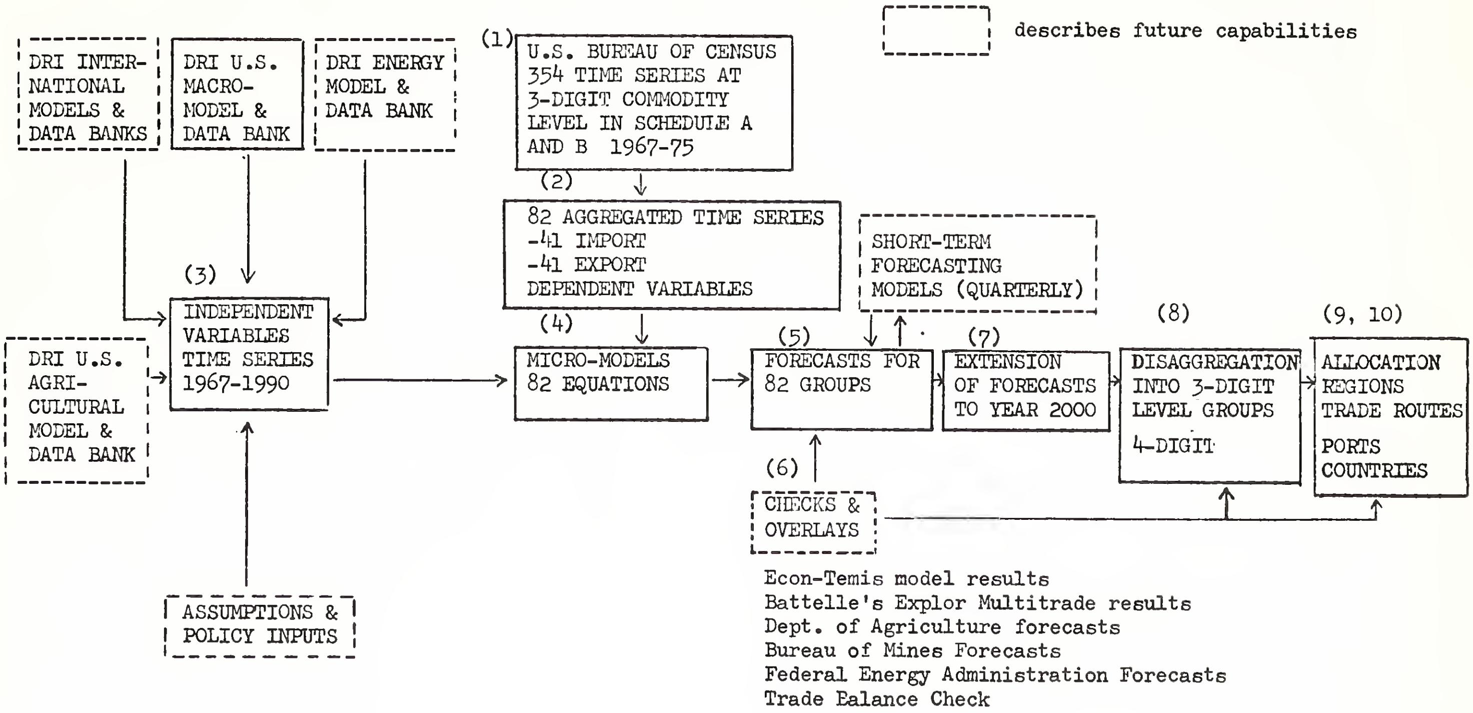
Step 8: The 82 commodity forecasts are disaggregated into 354 commodity details at the 3-digit level of classification. This is accomplished by regressing the historical composition of each major commodity group. (See Appendix H for details.)

Step 9: The 3-digit commodity forecasts are allocated to 19 regions in accordance with the historical share of the total trade by each region. (See Appendix A for the listing of 19 regions.) The results of these regional forecasts are presented in Volume II.

Step 10: The 3-digit commodity forecasts are allocated to trade routes in accordance with historical share of total trade by each trade route. The results of forecasts by trade routes are presented in Volume III. (See Appendix B for the listing of 65 trade routes and their definitions.)

Figure 1-1

1977 MARAD LONG-TERM WATERBORNE FOREIGN TRADE FORECASTING PROCEDURE


describes future capabilities
DRI INTER-NATIONAL MODELS & DATA BANKS
DRI U.S. MACRO-MODEL & DATA BANK
DRI ENERGY MODEL & DATA BANK
DRI U.S. AGRI-CULTURAL MODEL & DATA BANK
(1)
U.S. BUREAU OF CENSUS 354 TIME SERIES AT 3-DIGIT COMMODITY LEVEL IN SCHEDULE A AND B 1967-75
(2)
82 AGGREGATED TIME SERIES
-41 IMPORT
-41 EXPORT
DEPENDENT VARIABLES
(3)
INDEPENDENT VARIABLES TIME SERIES 1967-1990
(4)
MICRO-MODELS 82 EQUATIONS
SHORT-TERM FORECASTING MODELS (QUARTERLY)
(5)
FORECASTS FOR 82 GROUPS
(7)
EXTENSION OF FORECASTS TO YEAR 2000
(8)
DISAGGREGATION INTO 3-DIGIT LEVEL GROUPS
4-DIGIT
(9, 10)
ALLOCATION
REGIONS
TRADE ROUTES
PORTS
COUNTRIES
(6)
CHECKS & OVERLAYS
ASSUMPTIONS & POLICY INPUTS
Econ-Temis model results
Battelle's Explor Multitrade results
Dept. of Agriculture forecasts
Bureau of Mines Forecasts
Federal Energy Administration Forecasts
Trade Balance Check

1.3 Forecasting Assumptions

The models produce answers which are dependent upon inputs that are assumed. As indicated earlier, all 82 micro models used 43 independent variables which were forecasted by DRI. This means that MarAd's trade forecasts were closely dependent on the quality of DRI forecasts of independent variables.

DRI forecasts exogenous variables on the basis of a certain set of assumptions. Thus DRI's forecasting assumptions are directly pertinent to MarAd's trade forecasts.

Projections of the independent variables utilized in the micro models are those contained in the December 1976 simulation of the DRI long term model, called TRENDLONG 1276, covering the period 1976 to 1990. TRENDLONG is a steady growth, base simulation. It presents real growth of 6.2 percent in 1976, followed by four years of growth in a narrow band around 4.5 percent (4.8 percent in 1977, 4.7 percent in 1978, followed by 4.2 percent in 1979 and 1980). The stability can be ascribed to cautious monetary and fiscal policies and the absence of shocks such as wars, raw material shortages, major industrial strikes. It is assumed that the steady economic growth will continue during the 1980's without shocks, but at a lower real growth rate of 3.2 percent or even lower.

The unemployment rate is expected to decline gradually to a level of 5.6 percent in 1980 and further to 4.8 percent thereafter. The rampant inflation of the 70's will be arrested. The rate of increase of wholesale prices will drop by approximately one percentage point per year to an annual rate of three percent in 1980 and further to 2.8 percent thereafter. These estimates are based on the assumption that industrial capacity growth will be sufficient to prevent bottlenecks and farm production will be sustained at higher levels. The combination of steady growth and strong demographic factors is expected to produce housing construction demand of two million starts per year and annual retail car sales of 11 to 12 million units. (See table 1.)

DRI also has other alternative models such as CYCLELONG, and CONTROL LONG. These models differ principally in the degree of violence of economic fluctuations. The solution TRENDLONG

---

*Data Resources, Inc., The Data Resources U.S. Long-Term Review: Econometric Projections to 1990, Trend and Cycle Simulations, Winter, 1977.

Table 1-1

- MAJOR ECONOMIC ASSUMPTIONS -
HISTORY AND FORECAST OF MAJOR ECONOMIC INDICATORS
BY DRI'S TRENDLONG 1276 SOLUTION

								History		Trendlong1276	
	77	78	79	80	81	82	83	56-65	66-75	76-83	84-90
Rates of Change											
GNP-Current Dollars	10.2	10.2	9.3	9.4	8.6	8.7	7.9	5.6	8.2	9.5	7.2
-Constant Dollars	4.8	4.7	4.0	4.4	3.7	3.8	3.4	3.5	2.6	4.4	3.1
GNP Deflator	5.2	5.3	5.0	4.7	4.7	4.7	4.4	2.0	5.5	4.9	3.9
Consumer Price Index	5.0	5.2	4.8	4.8	4.7	4.6	4.5	1.6	5.5	4.9	4.0
Wholesale Price Index	5.0	5.3	5.0	4.6	4.3	4.2	4.0	1.0	6.3	4.6	3.3
Adj. Avg. Hourly Earnings	6.8	6.7	6.5	6.6	6.6	6.6	6.4	3.7	6.5	6.7	5.9
Shares of Real Demand (%)											
Consumption/GNP	64.1	64.3	64.2	64.0	63.8	63.6	63.7	60.9	61.7	64.0	64.6
Business Fixed Investment/GNP	9.3	9.5	9.6	9.9	10.2	10.4	10.6	9.2	10.2	9.8	10.8
(Excl. Polution Control Expend.)	8.9	9.0	9.2	9.5	9.7	9.9	10.1	9.2	10.0	9.4	10.4
Residential Construction/GNP	4.0	3.8	4.0	4.1	4.1	4.2	4.2	4.7	4.0	4.0	3.7
Government Purchases/GNP	20.4	20.1	19.8	19.5	19.4	19.2	19.2	23.6	22.7	19.8	19.0
Key Indicators of Activity											
Unemployment Rate	7.3	6.4	6.1	5.6	5.3	5.1	5.0	5.4	5.0	6.0	4.8
Retail Car Sales (Mill. Units)	10.6	11.3	11.4	11.8	11.8	12.1	12.2	6.8	9.5	11.4	12.5
Housing Starts (Mill. Units)	1.8	1.8	1.9	2.1	2.2	2.3	2.4	1.4	1.6	2.0	2.3
Savings Rate (%)	7.3	7.3	7.2	7.1	6.9	6.8	6.6	5.9	7.0	7.0	6.0
Federal Funds Rate	5.8	6.2	5.5	6.2	5.6	5.1	5.3	2.9	6.4	5.6	5.2
Prime Rate	6.8	7.0	6.2	6.6	6.4	5.7	5.8	4.4	7.1	6.4	5.7
New High-Grade Corp. Bond Rate	8.0	8.1	8.0	8.1	8.1	8.1	8.0	4.3	7.4	8.1	7.3

portrays the economy in the event that nothing goes wrong with economic growth. The solution CYCLELONG portrays an economy with business cycle fluctuations . . . incorporating a collection of shocks sufficient to create significant cycles in real activity. Prices, interest rates, and numerous other variables are affected by the shocks, and even certain trend values of some variables will differ. CONTROL LONG is a short-term trend line solution which indicates the probable average values for real magnitudes such as housing starts, auto sales, and production of particular industries.

It is clear, then, that the MarAd's forecasting system can easily adopt a new set of assumptions and yield different forecasts.

1.4 Accuracy of the Forecasts and Limitations

The users of the forecasts as well as the forecasters are naturally concerned with the accuracy of the forecasts. Unfortunately, one cannot really foretell how accurate one's forecasts will turn out to be. Accepting the reasonableness of the forecasting assumptions, the forecasters can only examine the goodness of the equations used in forecasting. The MarAd micro models are evaluated in terms of a number of statistics such as t ratios and R^2s, etc. The examination of these statistics for all 82 equations reveals that all but a few export equations are good.

The export equations are in general poorer (have less explanatory power in terms of independent variables used) than the import equations. This limitation seems to be unavoidable at present. The imports are largely dependent on the U.S. national data for which relatively good forecasts are available. In contrast, the construction of export equations is hampered by the scarcity of foreign data.

It must also be emphasized that the reliability of the forecasts diminish considerably as more detailed forecasts are made relative to highly aggregated forecasts. Therefore, relative to 82 commodity forecasts, 354 commodity level forecasts are deemed less reliable, and so are the regional and trade route forecasts.

1.5 Checking the Forecasts

In order to insure the quality of the forecasts three types of checks are made as indicated in Step 6 of the forecast procedure. First, forecasts made by other sources are compared with MarAd forecasts. Three major outside sources are consulted: for grain, U.S. Department of Agriculture, Economic Research Service provides forecasts to the year 1985; for a limited number of mineral imports and exports, the U.S. Department of Interior, Bureau of Mines provides data; and the Federal Energy Administration publishes energy forecasts. MarAd's micro model forecasts were generally found to be in concert with the forecasts of others. Whenever there appears to be significant differences between MarAd and outside forecasts, the cause of the differences (e.g., assumptions, etc.) is investigated. Whenever significant differences are accepted, they are so noted in each section of commodity forecasts.

The second check is made in terms of trade balance. The value of the trade balance (total export value-total import value) for every year since 1976 is calcualted and checked as to the reasonableness in comparison with those of the past. (See Table 2.4.)

The third check was made by comparing the 1976 forecasts with preliminary actual data for 1976 for each commodity. For example, MarAd's forecast for total imports is 456.0 million long tons. The preliminary data shows that the actual import volume was 462.0 million long tons in 1976; a 1.3 percent difference.

Since the forecasts show mainly the secular trend, there are many commodities for which the MarAd forecasts and the preliminary data diverge. This is due to a large extent to cyclical factors which are not incorporated into the long-term micro models used in our forecasts.

In the future, supplemental models, ECON's TEMIS and Battelle's EXPLOR models will be used to check the forecast results.* This cross checking will help to determine the causes for differences among various forecasts and improve the quality of forecasts in general.

---

*TEMIS (Trade Econometric Management Information System) was developed by ECON Inc. for MarAd as a tool to provide a five-year U.S. foreign trade forecast.

1.6 Time Horizon for Forecasts

The time horizon for these forecasts is 25 years, the nominal useful life of a commercial, oceangoing ship.*

1.7 Long-Term vs. Short-Term Forecasts

The long-term forecasts used in the micro models, consistent with the assumptions of DRI's macro model, show only the secular trend devoid of cyclical shocks or impulses.

In comparing the historical and forecast data, it can be noted that the former shows considerable annual fluctuations whereas the latter is shown to be a very smooth curve. This is because the historical data includes the effects of secular as well as cyclical and even random factors, whereas the long-term forecasts do not incorporate the cyclical and random factors. For example, both 1969 and 1971 trades were low due to dock strikes in respective years, and the 1975 trade volume was down due to a recession. These incidents cannot be predicted and they are not incorporated into the long-term forecasts. Thus, the long-term forecasts are in general devoid of annual peaks and valleys.

1.8 Waterborne Trade Share of Total (All Mode) Trades

Waterborne trade forecasts could have been made in two steps: First, forecast the total foreign trade by all methods of transportation, and then, take a certain share of it as the waterborne trade. In our forecasts, the waterborne trade is directly forecasted in one step. This direct forecast of waterborne trade was necessitated by the fact that no historical time series are available in tonnage for all modes of transportation. (They are available in value terms, but the conversion of these values in tonnage is considered another step to dilute the accuracy of the data.)#

---

*It must be noted that the forecasts up to 1990 were made using the micro models because the DRI's time series (independent variables for micro models) are available up to 1990. For this reason, the forecasts beyond 1990 were made based on extrapolation of the 1980-1990 growth rate projected by micro models.

#Shipping weight information is required to be reported for shipments by vessel and air only, and is not available for total trades.

The result of this direct waterborne tonnage forecast is that no explicit assumptions were made as to the share of waterborne trade with respect to total U.S. foreign trade. For example, we do not know explicitly what percentage of total U.S. foreign trade in 1980 or 1985 will be shipped by vessels, airplanes or overland modes. We only know the historical relationship of the waterborne to total foreign trade (1967-75) in terms of relative dollar values, but we do not know what is going to happen in the future. For example, more than half of the 82 micro-model commodities experienced a 5 percent or greater shift in transportation mode from 1967 to 1975. How will these continuing trends be reflected in our waterborne forecast? This was accomplished by the introduction of a time variable into the micro-models which generally captures these relative shifts among modes. For instance, the coefficient for the time variable for wood and lumber imports is shown to be negative. And this negative coefficient reflects the declining waterborne share of these imports.

1.9 MarAd's Publication Schedule for Trade Forecasts and Updating Services

MarAd's publications on trade forecasts are subject to periodic revisions, and occasional updates as needs arise.

While we do not expect the overall forecasts to be significantly different from year to year, wide-ranging discrepancies are expected, particularly in detailed forecasts, due to a number of factors. First, we will continually improve our micro-models in light of additional historical data each year. Second, the forecasts may be influenced by new sets of exogenous variables. Third, MarAd will develop an extensive system of checks and overlays to compare the forecasts from the micro-models to the results of other forecasting models such as the TEMIS, EXPLOR-MULTITRADE, and INFORUM models as they are fully linked to the micro-models. Fourth, a new set of assumptions may be adopted to run the micro-models to reflect more accurately the anticipated economic conditions in the United States and its trading partners and the public policies which will influence them.

In conclusion, MarAd sees the trade forecasts in an evolutionary process of continually improving the art of trade forecasts. Econometric models are based on historical relationships which can become outdated. We recognize that our forecasts should be renewed and revised in light of fresh information.

1.10 For More Information

In the Appendix, readers will find the definitions of 19 trade regions, 65 trade routes, commodity classification system used, detailed discussion of micro model forecasting methods, and DRI's exogenous variables.

For further information and consultation, write or call:

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PART II SUMMARY OF U.S. WATERBORNE FOREIGN TRADE FORECASTS

2.0 Total U.S. Waterborne Trade

Total U.S. waterborne tonnage, inbound and outbound, increased rapidly, at the rate of 7 percent per year, during the period 1967-75, but with sporadic oscillations. It began with 397 million long tons in 1967; peaked at the level of 638 million tons in 1973, and then fell to 622 million tons in 1975 due to the economic slump experienced in this period.

The forecast shows that the waterborne trade volume will rebound from its low level in 1975 to 701 million long tons by 1976. For the remaining period, the waterborne foreign trade tonnage will continue to grow at a rate of 4.95 percent per year during 1976-80, and will decelerate to a mere 2.6 level during the 1980-2000 period. The slower rate of growth after 1980 is due to an assumption that the oil imports will be drastically curtailed after 1980 in accordance with the U.S. energy policy.

2.1 Total Waterborne Imports

During the last nine years, the U.S. imported more in terms of tonnage (as well as in values) than it exported. In recent years, increasing oil imports accentuated this situation. In 1967, waterborne import tonnage exceeded export by 37 percent, and by 68 percent in 1974. The import-export tonnage ratio will reach as high as 1.98 in 1980. (See Table 2-1, last column.) The assumed decline in oil imports after 1980, then, will reduce the relative size of imports.

As of 1975, oil imports constituted 65 percent of total waterborne import tonnage. Accordingly, the volatility of

---

*Preliminary figures for 1976 indicate a sharp increase with the tonnage reaching an all time high of more than 710 million long tons. This means that our forecast is in error by a 1.3 percent margin.

Figure 2-1

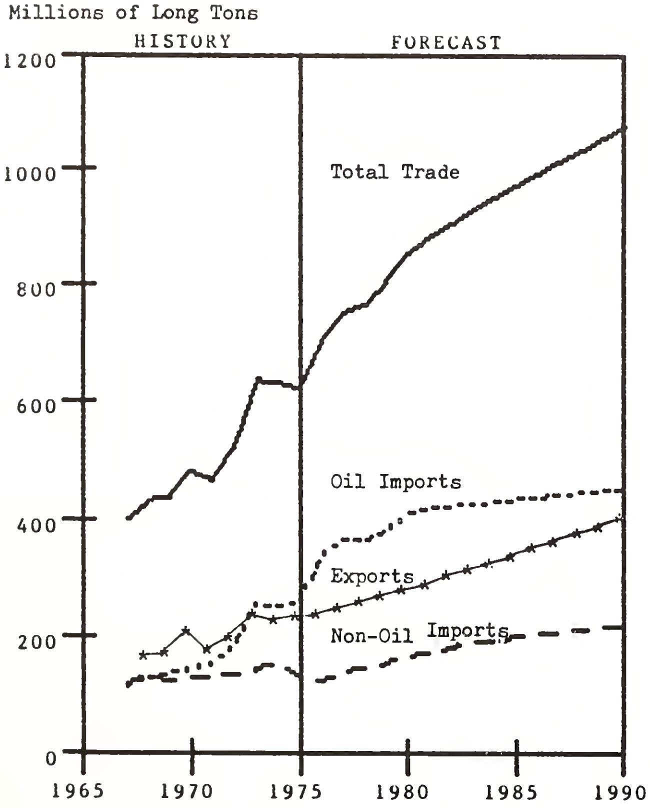

Table 2-1

U.S. WATERBORNE FOREIGN TRADE
1967 TO 2000
Millions Of Long Tons

	Year	Total Trade	Non-Oil Imports	Oil Imports*	Exports	Import Export Ratio
H#ISTORY	1967	396.6	117.4	111.8 (2.2)	167.3	1.37
	1968	426.1	127.1	125.4 (2.5)	173.6	1.47
	1969	435.7	121.7	136.0 (2.7)	178.0	1.45
	1970	481.4	127.6	139.7 (2.8)	214.1	1.25
	1971	461.9	128.6	151.0 (3.0)	182.3	1.53
	1972	518.8	130.6	182.7 (3.6)	205.5	1.52
	1973	638.0	139.9	253.3 (5.0)	244.8	1.61
	1974	633.7	147.7	249.9 (4.9)	236.1	1.68
	1975	622.3	127.9	254.1 (5.0)	240.3	1.59
FORECAST	1980	850.5	160.0	404.9 (8.0)	285.6	1.98
	1985	970.2	195.7	430.9 (8.5)	343.7	1.82
	1990	1075.5	215.4	450.2 (8.9)	409.9	1.62
	1995	1228.7	258.3	474.8 (9.4)	495.6	1.48
	2000	1420.9	317.1	500.7 (9.9)	603.1	1.36

*Figures in parenthesis are million barrels per day.
#Source: U.S. Bureau of Census, SA 305/705, U.S. General Imports/U.S. Exports

oil import forecasts is likely to affect the accuracy of the non-oil import forecasts as well. For this reason, the oil and non-oil imports are discussed separately.

Oil imports grew quite rapidly during the last nine years. From 1967 to 1975, the import tonnage grew at an average annual rate of 10.8 percent declining only in 1974 as a result of the OPEC oil embargo. In terms of actual shipments, in 1967 the oil import level was 2.2 million barrels per day but it reached a level of 5 million barrels per day in 1975.

The forecast calls for an annual growth rate of 9.8 percent up to 1980, falling, however, to 1.1 percent after 1980. The prospects for the post 1980 period assume modest success in energy conservation, self-sufficiency policies of the Government, and the availability of North Slope production after 1980 for domestic consumption. Needless to say, failure of conservation measures and lack of progress toward energy self-sufficiency will result in the continuance of high oil imports.

Among the non-oil imports, ores and scrap constituted the major import tonnage representing 47 percent of total non-oil waterborne import volume. Other major non-oil imports include: iron and steel (8.6 percent), stone, sand and gravel (6.0 percent), chemicals (5.9 percent), other crude materials (5 percent), other foods (4.6 percent), sugar (3.9 percent). During 1967-75, the non-oil imports increased slightly in volume, and they are forecast to increase very slowly in the future at the rate of 3.6 percent per year.

Although the total non-oil waterborne imports have grown and are expected to grow sluggishly, there are considerable variations in growth rates among the various components of imports. For example, during the last nine years, the fastest growing imports were the energy-related commodities, gas by 93 percent and coal by 90 percent.

The forecasts show that the non-oil commodities which will grow at 5 percent or more includes: meat, beverages, coal, natural gas, animal oils and fat, chemicals, leather, rubber products, lime and cement, refractory and non-refractory building materials, mineral manufactures, glassware, pottery and gemstones, machinery, clothing, shoes and luggage, and scientific equipment.

Table 2-2

U.S. WATERBORNE TRADE FORECAST
IMPORT GROUPS
1975-2000

Import Group	Percent in 1975		History 1975	1980	1990	2000	Annual % Growth	
	% of Total	% of Non-oil	Thousands of Long Tons				1967-1975	1975-2000
Meat	0.2	0.6	771	1376	2092	3179	2.5	5.8
Sugar	1.3	3.9	4985	8008	10000	12489	-2.0	3.7
All Other Foods	1.6	4.6	5927	6071	6069	6067	-3.0	0.1
Beverages	0.3	0.8	962	1545	2442	3859	6.7	5.7
Tobacco	0.0	0.1	174	178	311	546	4.1	4.7
Hides and Skins	0.0	0.0	24	31	28	25	-7.2	0.2
Oilseeds, Nuts and Kernels	0.0	0.0	17	19	8	4	-27.2	-5.6
Crude Rubber	0.2	0.6	774	1073	1633	2485	4.9	4.8
Wood, Lumber and Cork	0.5	1.5	1914	2748	1719	1074	-4.8	-2.3
Pulpwood and Waste Paper	0.1	0.2	286	245	126	65	-9.4	-5.8
Textile Fibers	0.0	0.1	152	272	121	54	-11.8	-4.1
Stone, Sand and Gravel	2.0	6.0	7722	10523	11315	12166	1.5	1.8
Other Crude Minerals	1.8	5.2	6701	8688	13672	21517	3.5	4.8
Metallic Ores and Scrap	15.8	47.1	60213	60704	71615	84486	-0.1	1.4
Animal and Vegetable Matl.	0.1	0.2	244	267	267	267	-1.9	0.4
Coal	0.6	1.8	2291	3454	9126	24117	43.8	9.9
Petroleum	66.5	-	254093	404889	450245	500682	9.5	2.8
Gas	0.4	1.0	1340	3540	7929	17757	69.7	10.9
Animal & Veg. Fats & Oils	0.3	0.8	1011	1513	2287	3456	10.5	5.0
Chemicals	2.0	5.9	7608	13335	28010	58838	9.0	8.5
Leather	0.0	0.0	13	35	52	76	-3.8	7.3
Rubber Manufactures	0.1	0.2	203	433	735	1247	15.3	7.5
Wood Products	0.4	1.1	1449	2489	2577	2668	-3.3	2.5
Paper Products	0.4	1.1	1431	2039	1968	1900	-6.7	1.1
Textile Yarns and Fabrics	0.1	0.4	562	763	605	479	-3.5	-0.6
Building Materials	0.7	2.1	2741	6814	10640	16613	11.2	7.5
Refractory Building Materials	0.0	0.1	121	363	691	1317	-1.4	10.0
Mineral Manufactures	0.0	0.0	59	86	148	254	11.4	6.0
Glass	0.0	0.1	156	186	85	39	-9.0	-5.4
Glassware, Pottery & Gems	0.1	0.2	217	279	459	757	2.2	5.1
Iron and Steel	2.9	8.6	11043	12426	12322	12218	0.7	0.4
Nonferrous Metals	0.2	0.6	704	696	542	422	-4.7	-2.0
Metal Manufactures	0.3	0.9	1137	1744	2236	2865	4.2	3.8
Machinery	0.4	1.2	1506	2337	5044	10889	5.7	8.2
Transportation Equipment	0.5	1.6	2059	3410	4816	6801	11.2	4.9
Fixtures	0.0	0.0	22	39	37	34	-3.2	1.8
Clothing, Shoes and Luggage	0.1	0.4	482	722	1110	1707	7.4	5.2
Furniture	0.0	0.1	124	186	249	333	7.3	4.0
Scientific Equipment	0.0	0.0	62	101	222	491	6.6	8.6
Miscellaneous Manufactures	0.1	0.4	508	1094	1923	3377	3.4	7.9
Miscellaneous Transactions	0.1	0.2	204	170	170	170	6.4	-0.7
Total	100.0		382008	564888	665643	817792	5.8	3.1

These imports, in 1975, represented 16 percent of the non-oil waterborne import tonnage and 30 percent of the value. In 2000, these high growth imports will account for 47 percent of the non-oil import tonnage and more than 44 percent of the value. The actual tonnage will increase from 19.4 million long tons in 1975 to 147.9 million tons in 2000.

In contrast, the relative importance of the following waterborne imports are forecast to decline: oil seeds and nuts, wood-lumber-cork, pulpwood, textile fibers, paper products, textile yarns and fabrics, glass, and nonferrous metals.

2.2 Total Waterborne Exports

In 1975, waterborne exports constituted 38 percent of total foreign trade and this percentage is expected to decline further as long as oil imports continue to increase.

The U.S. exports, however, have been picking up. Dollar devaluations of 1971 and 1973 coupled with a more flexible exchange rate system since early 1973 have clearly benefited U.S. exports. The U.S. share of total manufactured exports hit a low point in 1972, rose continually to 1975, before falling back in 1976.

The composition of the waterborne exports shows that grains (29.9 percent of total waterborne exports), coal (24.5 percent), crude fertilizers and minerals (7.3 percent), chemicals (6.4 percent), oil seeds and nuts (5.3 percent), wood-lumber and cork (4.8 percent), and oil (4.3 percent) constituted seven major export commodities in 1975, and this relative composition will remain in the years to come.

Overall growth of the waterborne exports had been at 5.6 percent during the past nine years although there were some ups and downs due primarily to longshoremen strikes in 1969 and 1971. In terms of absolute tonnage, the nine-year average increment was 9.1 million long tons per year.

The growth rate of waterborne exports is expected to slow down during the next five years to a level of 3.5 per year. It will then pick up slightly after 1980 and will grow at the rate of 3.8 percent per year. In terms of absolute tonnage, the waterborne exports will grow, on the average, by 11.3 million tons per year in the future.

Table 2-3

U.S. WATERBORNE TRADE FORECAST
EXPORT GROUPS
1975-2000

Export Group	Percent in 1975	History 1975	1980	- Forecast - 1990	2000	Annual % Growth 1967-1975	1975-2000
	%	Thousands of Long Tons					
Grains	29.9	71747	82448	109684	145916	6.7	2.9
Animal Feeds	2.4	5678	8923	16198	29401	6.3	6.8
All Other Foods	1.0	2512	2792	3534	4474	2.4	2.3
Beverages	0.0	89	153	276	500	15.9	7.1
Tobacco	0.2	369	423	539	687	1.0	2.5
Oilseeds and Nuts	5.3	12799	15068	21742	31372	6.3	3.7
Wood, Lumber and Cork	4.8	11495	16711	26491	41994	5.1	5.3
Pulp and Waste Paper	1.2	2826	3356	5152	7908	5.9	4.2
Manmade Fibers	0.0	109	242	692	1977	11.7	12.3
Natural Fibers	0.5	1127	1498	1575	1656	0.3	1.6
Crude Fertilizers & Minerals	7.3	17475	22268	32610	47755	3.1	4.1
Metallic Ores and Scrap	4.1	9846	9939	13958	19602	-2.1	2.8
Other Crude Materials	0.3	741	809	919	1044	0.9	1.4
Coal	24.5	58898	58829	76738	100099	3.2	2.1
Petroleum	4.1	9792	9612	8647	7779	-3.9	-0.9
Gas	0.4	922	922	884	847	20.5	-0.3
Animal & Vegetable Oils & Fats	0.7	1685	2134	2999	4215	0.5	3.7
Chemicals	6.4	15412	21442	36879	63428	4.7	5.8
Leather	0.0	18	26	45	77	9.2	6.0
Rubber Manufactures	0.1	128	145	199	272	8.6	3.2
Wood Manufactures	2.5	6030	10284	21328	44233	18.7	8.3
Paper Manufactures	0.8	1971	2837	4483	7085	1.9	5.3
Textile Yarns and Fabrics	0.2	377	785	1628	3376	9.7	9.2
Building Materials	0.2	528	770	1151	1721	5.3	4.8
Glass	0.0	70	149	318	676	3.8	9.5
Glassware, Pottery & Gems	0.0	76	110	168	255	2.7	5.0
Iron and Steel	0.8	1969	5259	9412	16846	4.6	9.0
Nonferrous Metals	0.2	503	798	1466	2766	1.4	7.1
Utensils	0.0	14	25	43	75	1.9	6.9
Metal Manufactures	0.2	479	817	1464	2624	7.5	7.0
Nonelectrical Machinery	1.0	2489	3225	4536	6382	8.3	3.8
Electrical Machinery	0.2	523	756	1171	4814	10.6	5.1
Transportation Equipment	0.5	1242	1424	1898	2529	7.6	2.9
Heating and Plumbing Equip.	0.0	23	31	48	75	1.2	4.8
Furniture	0.0	24	42	76	138	3.4	7.2
Travel Goods	0.0	3	6	11	20	12.6	7.9
Clothing	0.0	21	17	8	4	-2.0	-6.4
Footwear	0.0	2	2	3	4	8.0	2.8
Instruments	0.0	98	165	296	531	7.6	7.0
Miscellaneous Manufactures	0.1	205	316	529	887	5.9	6.0
Miscellaneous Transactions	0.0	18	24	35	50	5.3	4.2
Total	100.0	240332	285581	409851	603093	4.1	3.7

Although, in general, U.S. exports remain sluggish in the future, there are a number of commodities with high growth potential of 5 percent or more per year. These include: animal feedstuffs, beverages, wood, lumber and cork, manmade fibers, chemicals, leather, wood manufactures, paper products, textile products, glass, iron and steel, nonferrous metals, glassware, pottery and gems, utensils, metal manufactures, electrical machinery, furniture, travel goods, and instruments. These exports will increase their share of the total export volume from 18.7 percent in 1975 to 36.6 percent in 2000. The actual tonnage will increase from 44.9 million long tons in 1975 to 220.8 million long tons by 2000. In terms of value, these exports were worth more than $27.9 billion in 1975 or 45.4 percent of the total waterborne export value in that year. Their high growth potential means that by 2000 they will be contributing as much as 57 percent of the U.S. waterborne export earnings.

Exports with less bright prospects, or growth less than 2 percent are: oil, natural gas, metallic ores and srap, natural fibers, and other crude materials. In 1975 these items accounted for 9.4 percent of the total waterborne export tonnage and 6.2 percent of the export earnings or $3.8 billion. The relative importance of this group to the waterborne export volume will fall to 5.1 percent by 2000.

2.3 Trade Balance

An increasing share of imports relative to exports is likely to be reflected in increasing trade deficits.

Table 2-4 shows the trade balance (surpluses and deficits) due to waterborne imports and exports. In viewing this table, one must remember that it shows only the waterborne foreign trade. It was assumed that oil imports would be curbed after 1980. If the U.S. finds itself importing oil at an ever-increasing rate, the trade deficits will be much more significant than shown in this table.

Table 2- 4

U.S. WATERBORNE TRADE BALANCE
1967 - 2000

(Figures in Millions)

	Imports		Exports		Trade Balance	
Year	Dollars	Long Tons	Dollars	Long Tons	Dollars	Long Tons
1967	17434	229	18633	167	1199	-62
1968	21139	252	19354	174	-1785	-78
1969	21571	258	19910	178	-1661	-80
1970	24731	267	24393	214	-338	-53
1971	26994	280	22609	182	-4385	-98
1972	33617	313	25520	205	-8097	-108
1973	42702	393	39631	245	-3071	-148
1974	67013	398	55497	236	-11516	-162
1975	63464	382	61400	240	-2064	-142
1980	96497	565	80673	286	-15824	-279
1985	113836	627	99561	344	-14275	-283
1990	132758	666	120970	410	-11988	-256
1995	160666	733	149530	495	-11136	-237
2000	198660	818	186031	603	-12629	-215

In 1967, there was a $1.2 billion trade surplus. But it turned into a deficit in the following year at the level of $1.8 billion. The deficit grew steadily to a level of $8.1 billion in 1972 as the size of oil imports grew. Then there was an oil embargo in 1973 by OPEC so that the volume of oil imports shrunk in that year as did the trade deficit to $3.1 billion. In the ensuing year, 1974, the pent-up demand for oil imports and higher oil prices shot up the trade deficits to the level of $11.5 billion. It is forecast that by 1980, the continuing growth of oil imports will lead to a deficit of nearly $16 billion. Assuming that the oil imports will decline in accordance with the Government energy policy, the deficit may stabilize at the level of $12 billion in later years.

In conclusion, the deficit is almost entirely due to a surge in oil imports accompanied by higher prices. Although oil imports are assumed to flatten out, or decline, after 1980 or about, imports generally are expected to stay strong, as the U.S. economy picks up momentum. If it were not for oil, the U.S. would be chalking up massive trade surpluses. But U.S. trade deficits are expected as the country bears the burden of higher oil prices.

2.4 Implications

What do these forecasts mean for merchant shipping and shipbuilding? Answers to these questions must await a detailed analysis of regional and trade route forecasts presented in volumes II and III of this report. Furthermore, these trade forecasts have to be translated into ship requirement forecasts and ship deployment plans with the aid of other forecasting models. In the absence of this work, only general observations can be made at this time. However the readers will find a graphic summary of regional and trade route forecasts presented at the end of this section. The graphs show trade volume, not value.

The forecast growth for waterborne trade is generally slower than that of the past. The major reasons are: the 1975 recession and shocks of recent years have dampened the trade outlook; and losses in waterborne share experienced by more than half of the micromodel groups from 1967 to 1975 which are assumed to continue in the future. In spite of the slow growth outlook, there is considerable room for the U.S. merchant marine to increase its share of the U.S. trade shipping market because, in 1975, U.S. flag ships carried only 5.1 percent of U.S. waterborne foreign trade.

In response to growing oil imports to 1980, the demand for tankers will continue to increase. Alaskan oil production will, however, slow the growth of oil imports in later years. A redeeming factor for U.S. tankers is that a part of the Alaskan oil will be preference cargo under the Jones Act. Also oil imports from Canada (85% landborne in 1975) are expected to be diverted to waterborne sources which will step up the need for tankers. The future demands for tankers are, however, greatly dependent upon U.S. energy policy and cargo preference legislation.

The Bulk commodities will in general grow slowly. Those associated with U.S. construction activity will spurt over the next five years, but will be dampened in the long run as the World War II baby boom grows past the age of household formation. Bulks related to the metal industry will be dampened as crude ores are increasingly preprocessed at the point of origin. Foreign demands for U.S. coal exports, used for metal production and power generation, are expected to be strong. Real concerns, however, remain as to the ability of U.S. coal mines to produce the coal to satisfy stepped up domestic demands as well as foreign markets, given stricter strip-mining legislation. More stringent requirements in terms of strip-mining reclamation as well as lands available for strip-mining could reduce reserves available for production and increase the cost of production from existing lands. While exports are dampened by these constraints, imports, although much smaller, should benefit. In the agricultural sector grain exports will be limited by reduced domestic stocks, while sugar imports will be hindered by the increasing use of indigenous corn syrups. A bright spot among the bulks are the chemicals which will benefit from the increasing use of fertilizers.

The outlook for the general cargo trades is better than that for the bulks. Machinery, instruments, transportation equipment and various consumer's goods should respond to rising consumer expenditures and investment here and abroad. These trades will also benefit as OPEC countries spend their oil dollar receipts.

Table 2-5

U.S. WATERBORNE TRADE FORECAST
BY CARGO TYPE
1975 - 2000

Cargo	History 1975	1980	1990	2000	Annual Growth 1975 - 2000
	Millions of Long Tons				%
Tanker	256	410	459	520	2.9
Bulk	285	323	431	595	3.0
General	81	118	185	306	5.5

The demand for merchant ships depends not only on the trade volumes, but also on the distances (origins and destinations) over which these volumes are carried. Tables 2-6 and 2-7 present the forecast of total U.S. trade by regions and trade routes, respectively. 3-digit commodity detail is contained in volumes 2 and 3, and approximate trade route distances are listed in Appendix C . The allocation of trade volumes to regions and routes is based on historical trends and averages (see Appendix H). To the extent that origins and destinations impact directly on ship demand, the Division plans more in-depth analysis in the future.

Figure 2-2

U.S.-REST OF WORLD
FORECAST SUMMARY

(Millions of Long Tons)

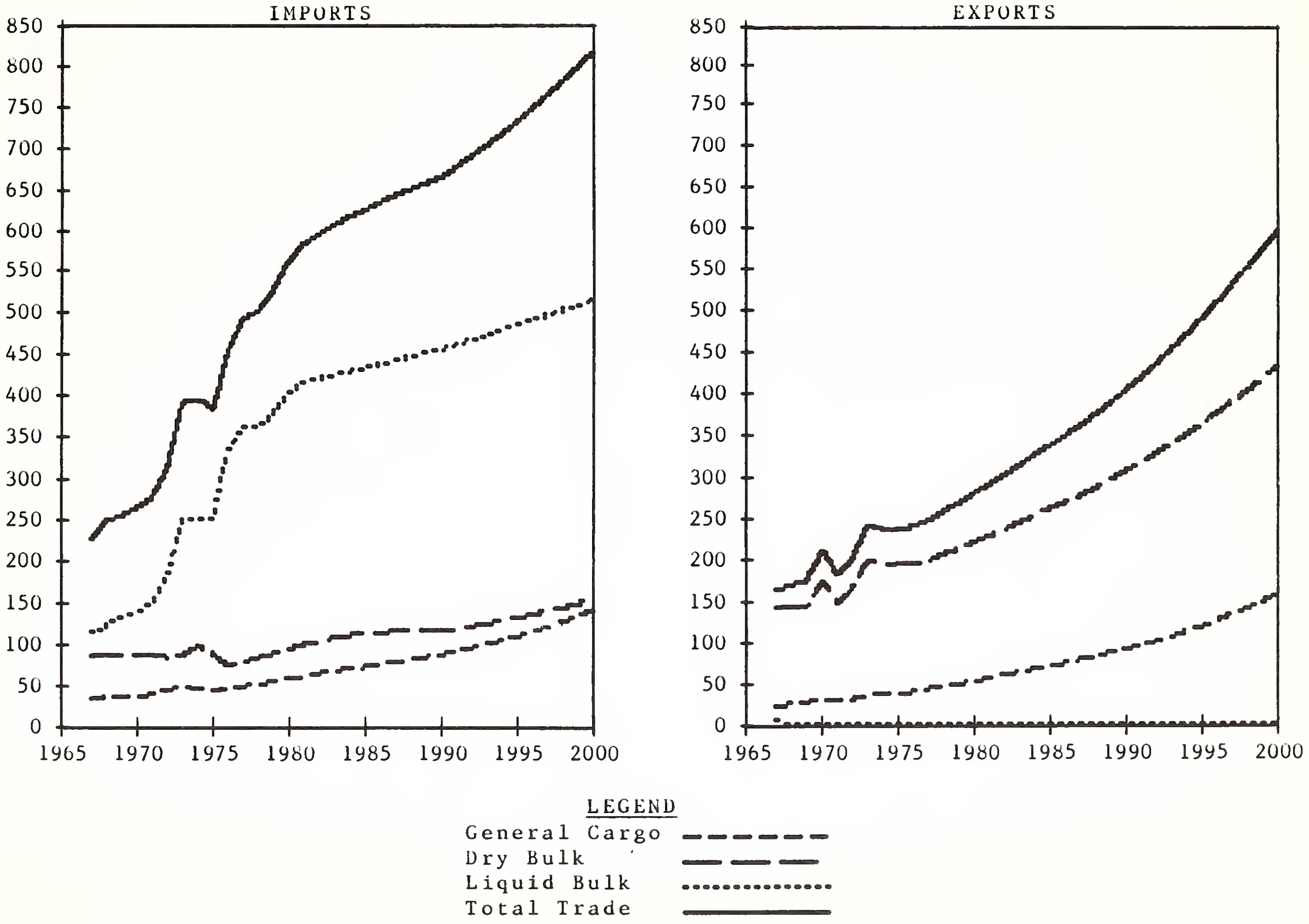

Table. 2-6

U.S. WATERBORNE TRADE FORECAST
BY REGIONS
1975 - 2000

Region*	Percent and Rank in 1975		History 1975	- Forecast - 1980	1990	2000	Annual Growth 1975 - 2000
	%	Rank	Thousands of Long Tons				%
1 Canada	9.9	5	61635	77484	90831	112710	2.4
2 Eastern South America	12.8	1	79648	109588	126770	157262	2.8
3 Western South America	1.9	13	11569	14938	18555	23035	2.8
4 Caribbean	9.9	4	61673	91801	106058	130528	3.0
5 Central America	.8	17	5262	5453	6764	8856	2.1
6 Mexico	1.9	12	11891	12945	17681	24238	2.9
7 Northern Europe	9.3	6	57634	74628	107191	164597	4.3
8 Mediterranean Europe	4.8	9	29998	40624	52250	72384	3.6
9 United Kingdom	1.3	15	8069	10458	14309	21478	4.0
10 North Africa	4.7	10	29246	37141	43853	50418	2.2
11 Developing Africa	8.2	8	51333	80823	94655	107334	3.0
12 South Africa (Rep.)	.4	18	2308	2282	3237	5116	3.2
13 Middle East	11.1	3	68936	106094	127434	149655	3.1
14 Japan	11.4	2	70639	90432	133188	204247	4.3
15 East Asia	6.4	7	39573	53279	68863	89706	3.3
16 South Asia	1.5	14	9629	8804	10052	12148	0.9
17 Communist Asia	.1	19	649	4590	6914	10396	11.7
18 Communist Europe	2.5	11	15587	20373	32099	49492	4.7
19 Australia and Oceania	1.1	16	7041	8713	14775	27269	5.6
Total	100.0		622340	850469	1075495	1420885	3.4

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*See Appendix for region descriptions.

Table 2-7

U.S. WATERBORNE TRADE FORECAST
BY TRADE ROUTES
1975-2000

Trade Route*	Percent and Rank in 1975		History 1975	- Forecast - 1980	1990	2000	Annual Growth 1975 - 2000
	%	Rank	Thousands of Long Tons				%
1	1.8	17	11439	8442	10965	14604	1.0
2	.5	33	3299	4272	5242	6619	2.8
4	13.7	1	84943	131712	144343	169485	2.8
5	.7	31	4080	4743	6558	9609	3.5
6	.7	27	4381	5731	8223	12681	4.3
7	.7	28	4267	7191	11227	19531	6.3
8	1.4	19	8617	13730	18222	26899	4.7
9	1.3	20	7822	7351	9644	13154	2.1
10	4.8	6	29980	48413	58441	72623	3.6
11	.5	35	2985	4951	7590	12062	5.7
12	4.4	8	27658	33902	50596	73989	4.0
13	5.4	4	33845	37320	51148	71206	3.0
16	.7	32	4052	3993	5430	8497	3.0
17	3.0	11	18847	27743	33666	40200	3.1
18	4.3	9	26471	56203	67652	80526	4.6
19	11.9	2	73903	68993	87055	92265	0.9
20	1.1	21	7098	7826	11924	18323	3.9
21	5.3	5	32715	37293	54938	83004	3.8
22	3.7	10	23239	29287	39324	53932	3.4
23	.9	25	5474	6748	8009	10264	2.5
24	.1	48	388	471	661	964	3.7
25	1.1	22	6976	8686	10242	11857	2.1
26	.7	29	4243	5357	7481	10880	3.8
27	.5	34	3187	5170	9269	16744	6.9
28	2.6	15	16162	28885	33860	38485	3.5
29	5.7	3	35510	49866	76427	124922	5.2
31	.8	26	4682	4764	6381	8603	2.5
32	1.0	23	6046	9675	13473	20325	5.0
33	.0	52	138	227	283	368	4.0
34	.2	40	1319	1519	2067	2913	3.2
35	.0	51	159	270	302	414	3.9
36	.0	53	102	105	141	340	4.9
37	.0	64	-	3	5	8	-
38	.0	63	2	3	3	5	3.7
41	2.9	13	18193	45337	53383	60480	4.9
42	2.9	12	18231	23871	27544	31147	2.2
43	.1	4	481	366	429	483	0.0

Table 2-7---- Continued

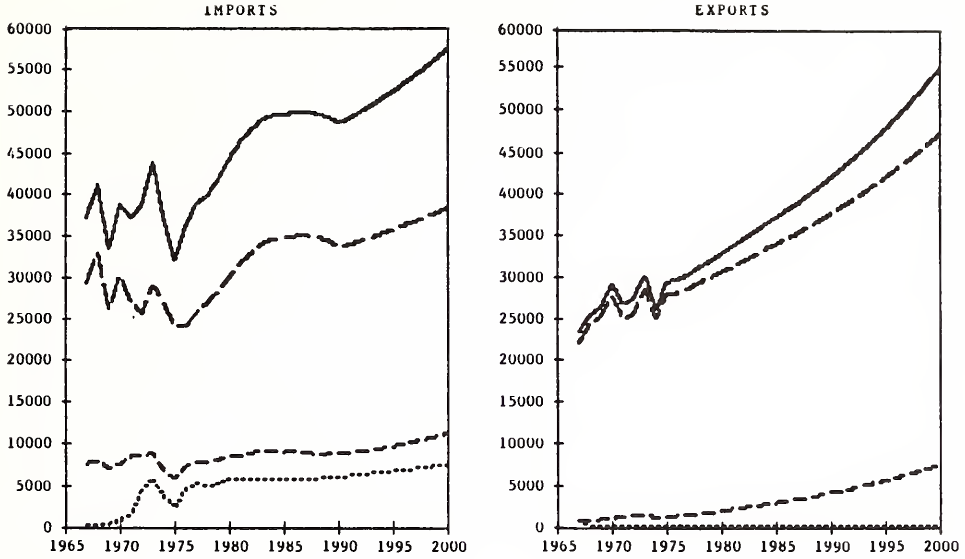
Trade Route	Percent and Rank in 1975		History 1975	- Forecast - 1980	1990	2000	Annual Growth 1975 - 2000
	%	Rank	Thousands of Long Tons				%
51	.2	39	1405	1365	1851	2749	2.7
52	.3	38	1601	1488	1970	2957	2.5
53	.0	49	195	174	231	329	2.1
54	.0	55	70	75	75	82	0.6
55	.0	60	38	61	75	103	4.1
56	.0	50	177	300	419	603	5.0
58	.0	62	16	160	197	272	12.0
59	.1	45	847	1960	2481	3271	5.6
60	.0	59	58	79	83	90	1.8
61	4.6	7	28801	31850	36712	44485	1.8
65	.3	37	1863	1681	2283	3239	2.2
71	.1	46	540	766	949	1232	3.4
72	.2	41	1123	1527	2248	3319	4.4
77	.0	61	20	41	86	60	4.5
78	.0	56	65	89	115	152	3.5
80	.0	58	59	55	65	85	1.5
81	1.6	18	9896	15196	16563	19012	2.6
82	.4	36	2395	3556	5442	8340	5.1
83	.0	57	61	92	122	179	4.4
84	.0	54	92	140	208	329	5.2
85	.2	43	1029	1951	1985	2753	4.0
86	.1	44	856	896	1475	2307	4.0
87	.9	24	5654	7705	9549	12666	3.3
89	2.1	16	12993	15678	18308	21745	2.1
91	2.6	14	16265	23672	26674	30340	2.5
92	.7	30	4137	8907	10165	11715	4.3
93	.2	42	1085	1429	1838	2655	3.6
Total	100.0		622340	850469	1075495	1420885	3.4

---

*See Appendix for trade route descriptions.

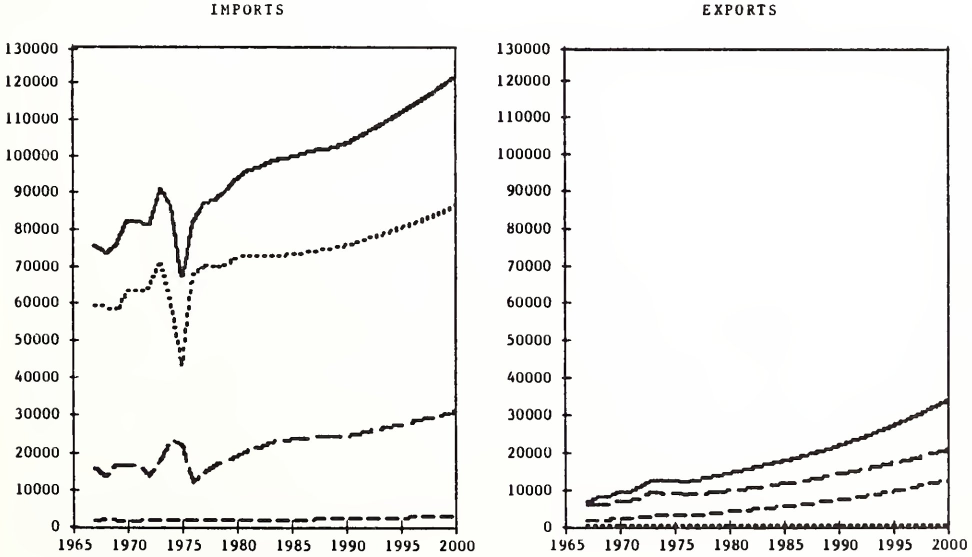
REGION 01
CANADA
FORECAST SUMMARY

(000 Long Tons)



REGION 02
EASTERN SOUTH AMERICA
FORECAST SUMMARY

(000 Long Tons)

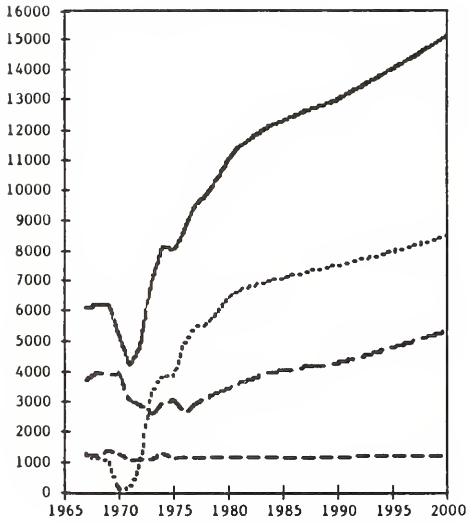


LEGEND
General Cargo — — — — — —
Dry Bulk — — —
Liquid Bulk ••••••••••••••
Total Trade ———

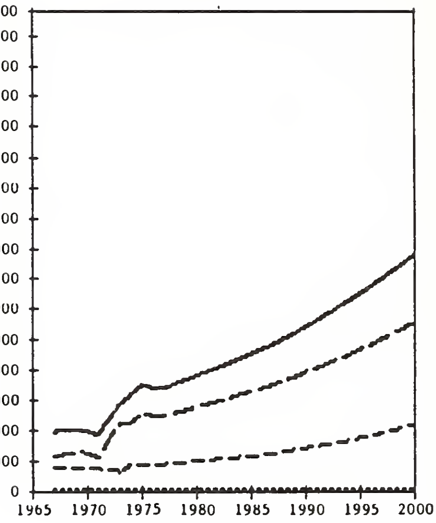
REGION 03
WESTERN SOUTH AMERICA
FORECAST SUMMARY

(000 Long Tons)

IMPORTS



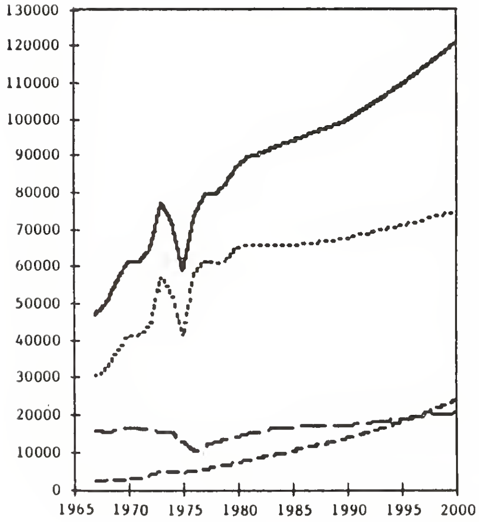
EXPORTS



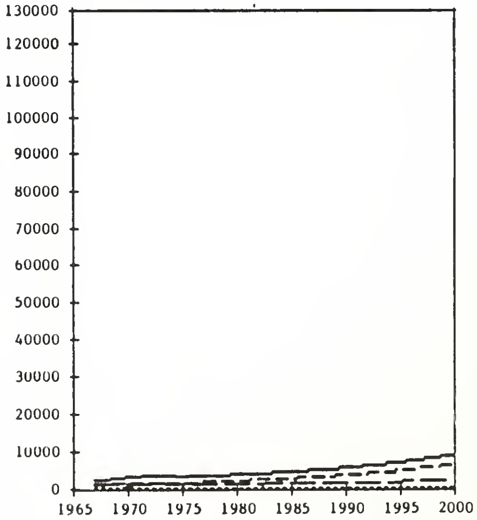
REGION 04
CARIBBEAN
FORECAST SUMMARY

(000 Long Tons)

IMPORTS



EXPORTS

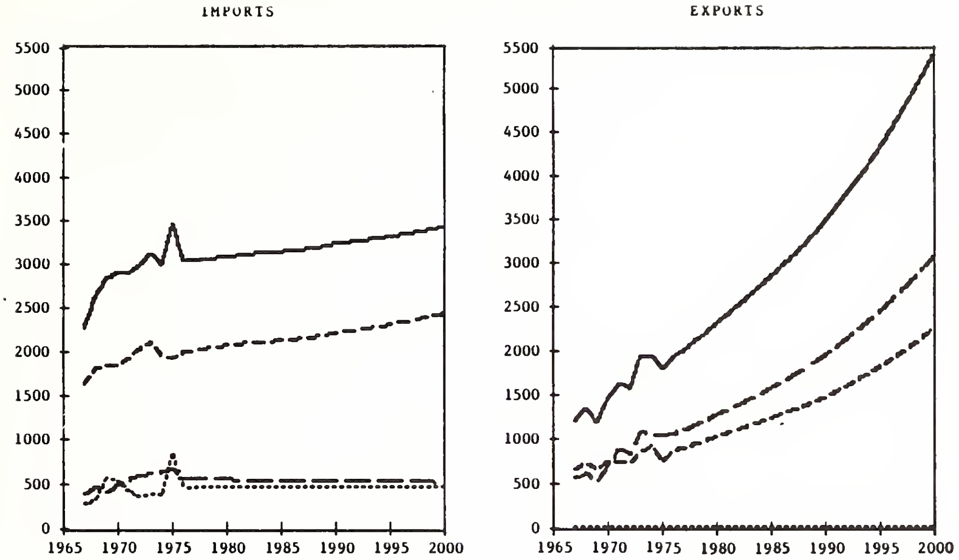


LEGEND

General Cargo – – – – – –
Dry Bulk —— —— ——
Liquid Bulk ••••••••••••••
Total Trade ————————

REGION 05
CENTRAL AMERICA
FORECAST SUMMARY

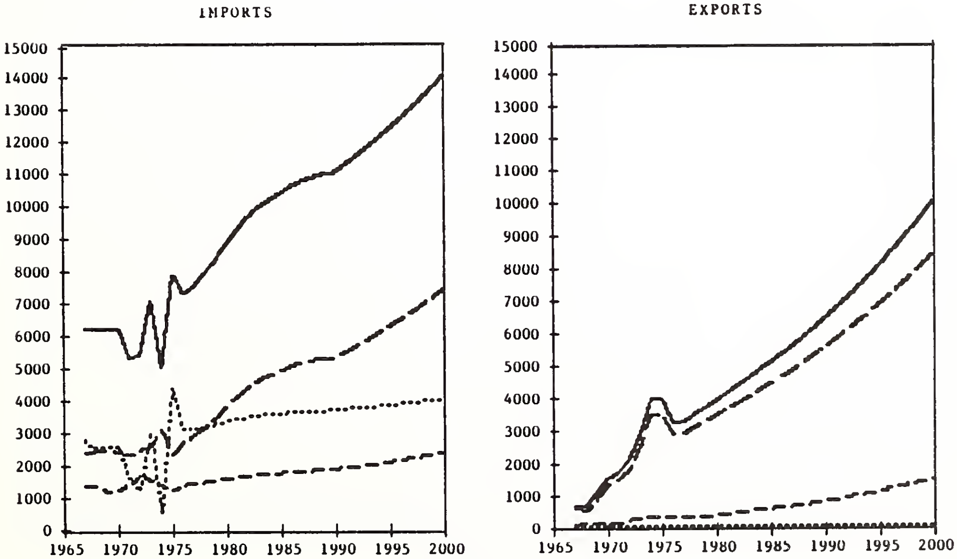
(000 Long Tons)


IMPORTS

EXPORTS

REGION 06
MEXICO
FORECAST SUMMARY

(000 Long Tons)

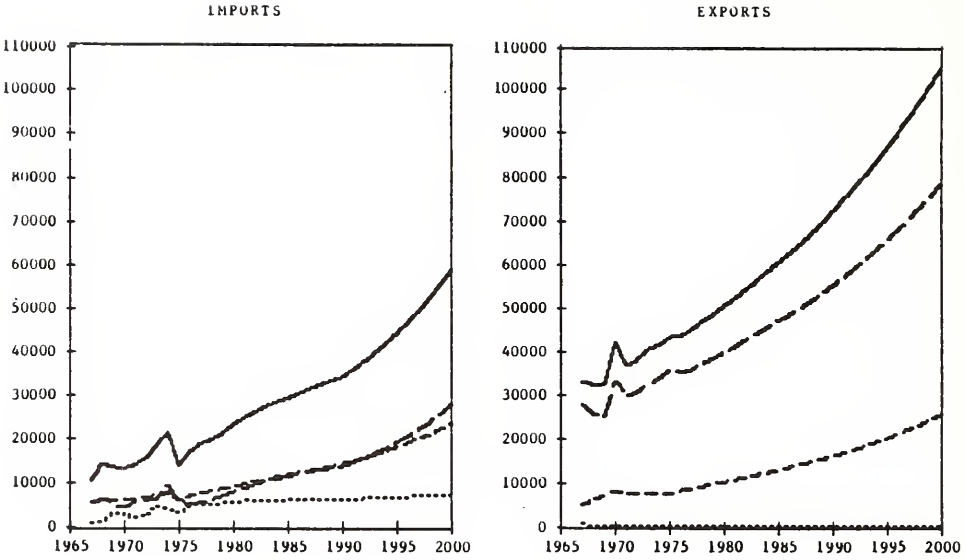

IMPORTS

EXPORTS

LEGEND
General Cargo - - - - - -
Dry Bulk — — —
Liquid Bulk ··············
Total Trade ————

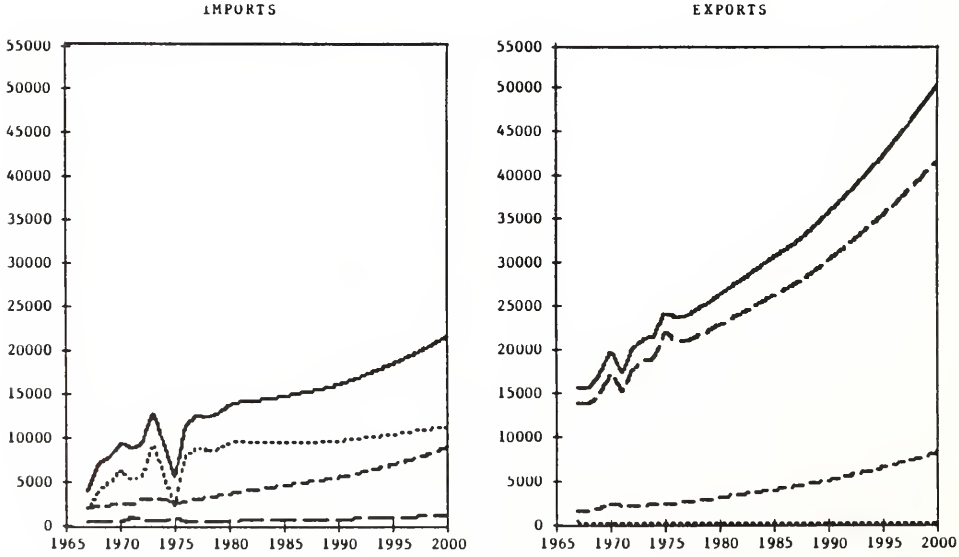
REGION 07
NORTHERN EUROPE
FORECAST SUMMARY

(000 Long Tons)



REGION 08
MEDITERRANEAN EUROPE
FORECAST SUMMARY

(000 Long Tons)

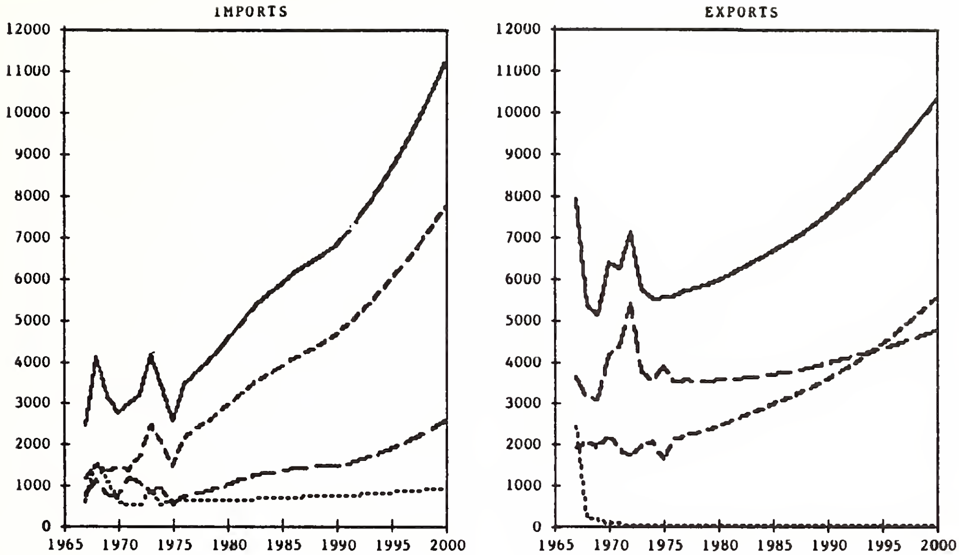


LEGEND

General Cargo	- - - - - -
Dry Bulk	— — —
Liquid Bulk	··············
Total Trade	————

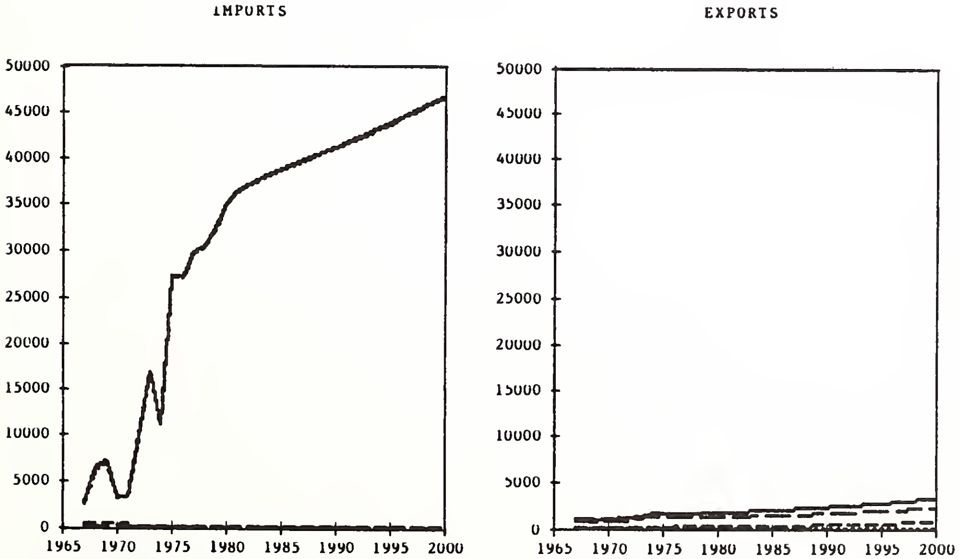
REGION 09
UNITED KINGDOM
FORECAST SUMMARY

(000 Long Tons)



REGION 10
NORTH AFRICA
FORECAST SUMMARY

(000 Long Tons)

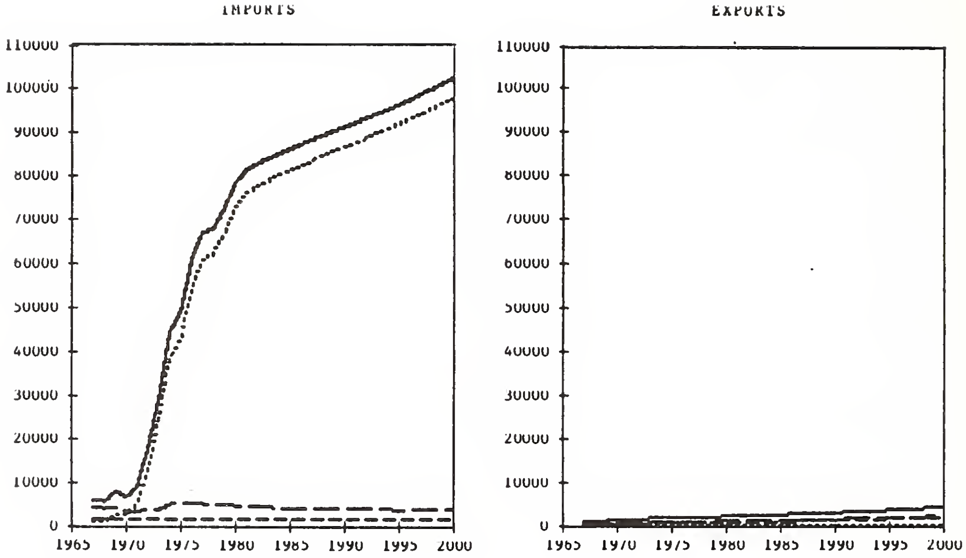


LEGEND

General Cargo - - - - - -
Dry Bulk — — —
Liquid Bulk ··············
Total Trade ———

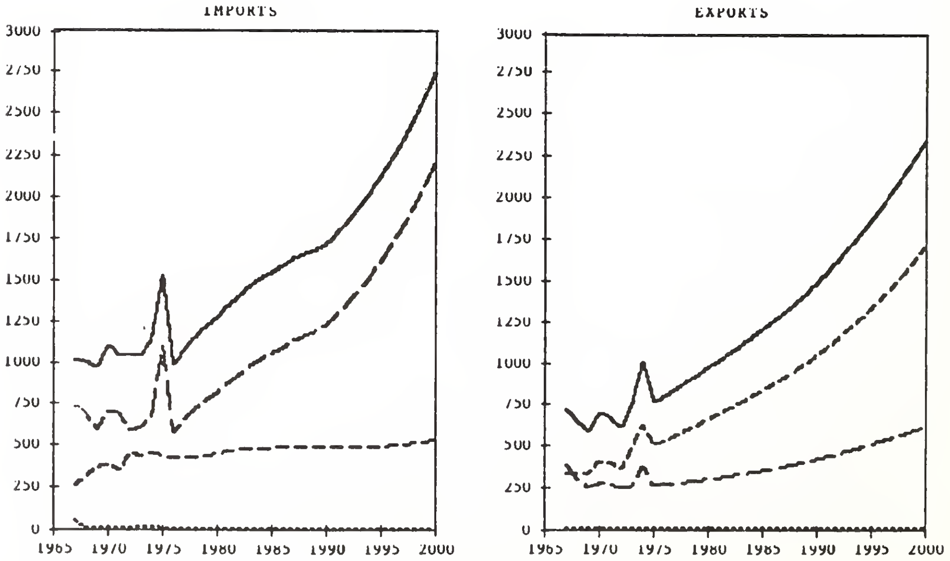
REGION 11
DEVELOPING AFRICA
FORECAST SUMMARY

(000 Long Tons)



REGION 12
REPUBLIC OF SOUTH AFRICA
FORECAST SUMMARY

(000 Long Tons)

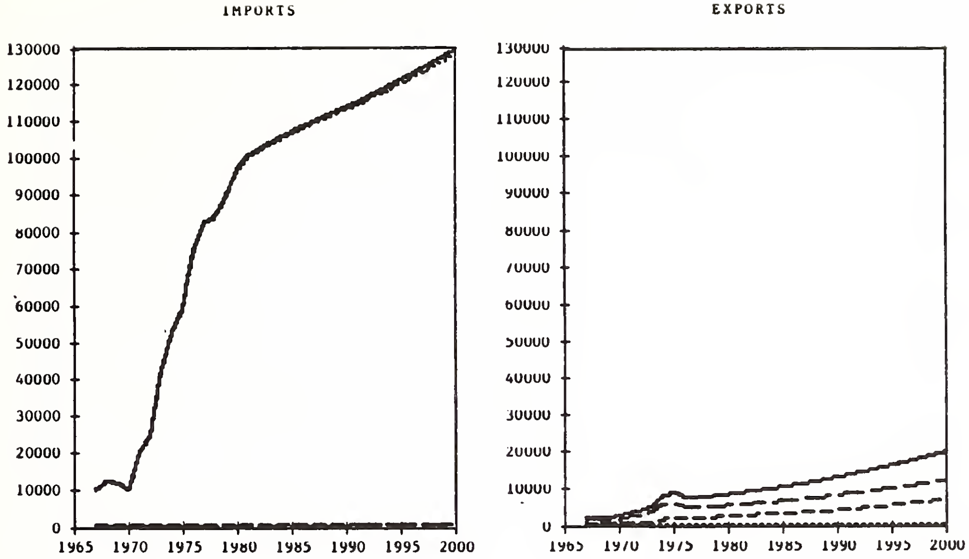


LEGEND

General Cargo – – – – – –
Dry Bulk —— —— ——
Liquid Bulk ··············
Total Trade ————————

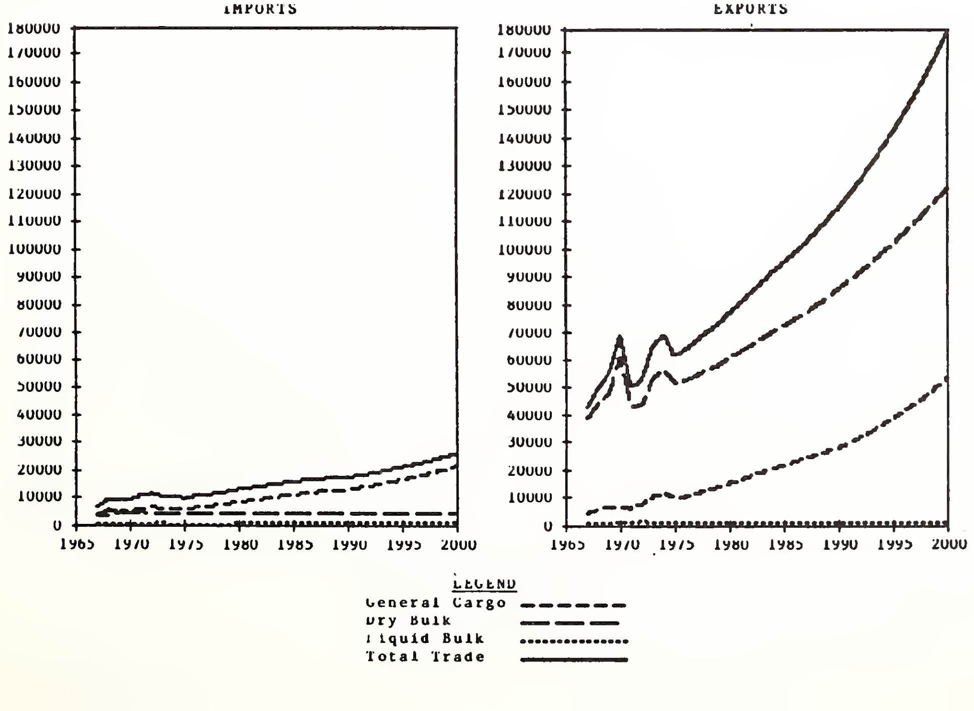
REGION 13
MIDDLE EAST
FORECAST SUMMARY

(000 Long Tons)



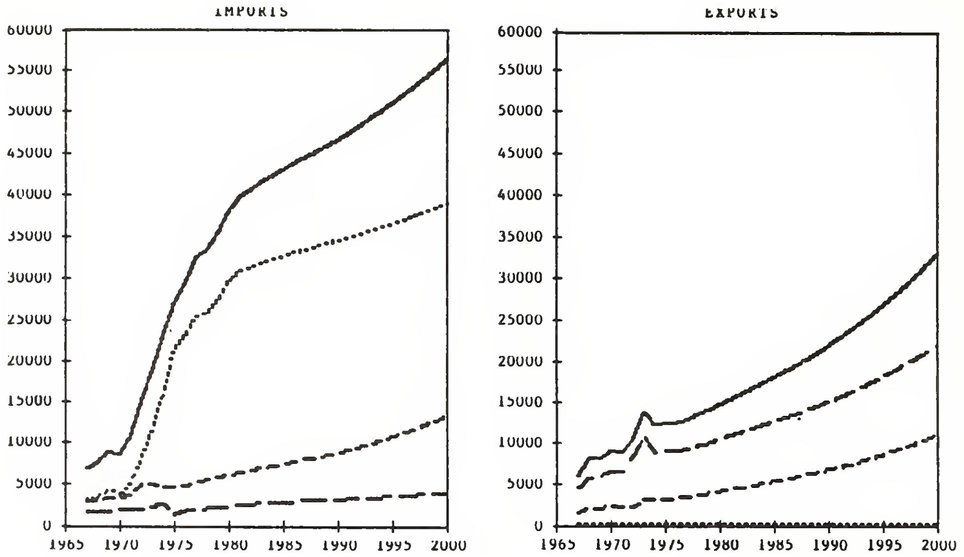
REGION 14
JAPAN
FORECAST SUMMARY

(000 Long Tons)



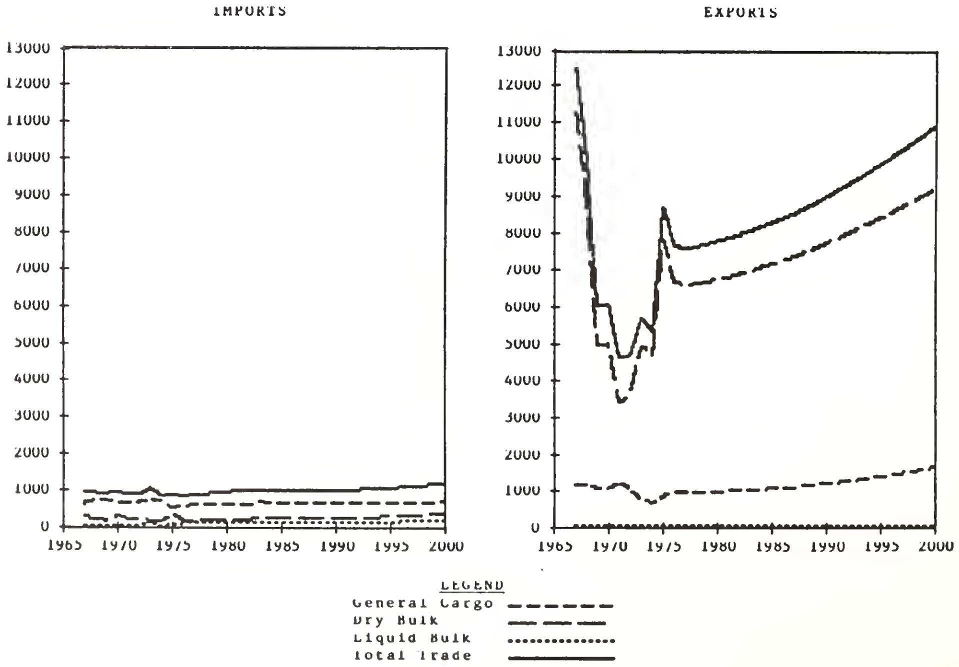
REGION 15
EAST ASIA
FORECAST SUMMARY

(000 Long Tons)



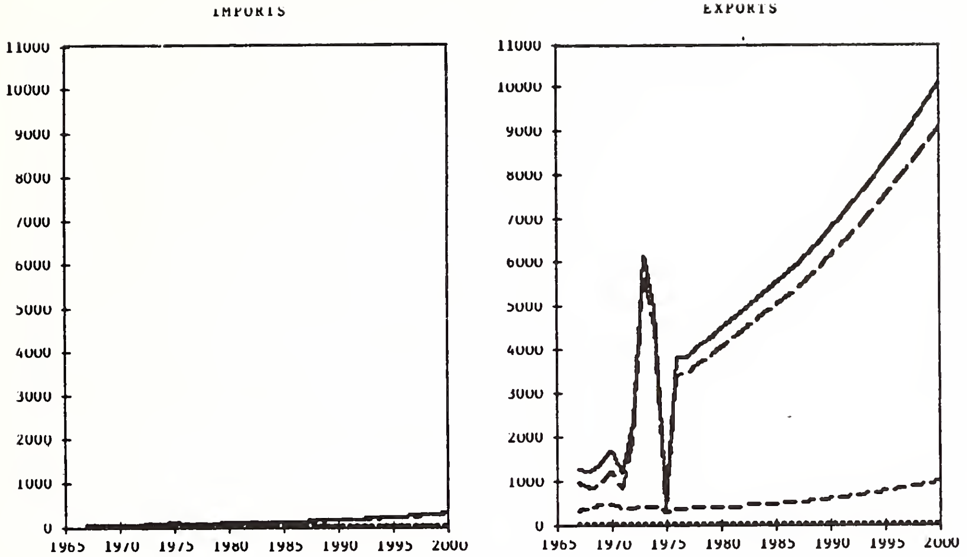
REGION 16
SOUTH ASIA
FORECAST SUMMARY

(000 Long Tons)



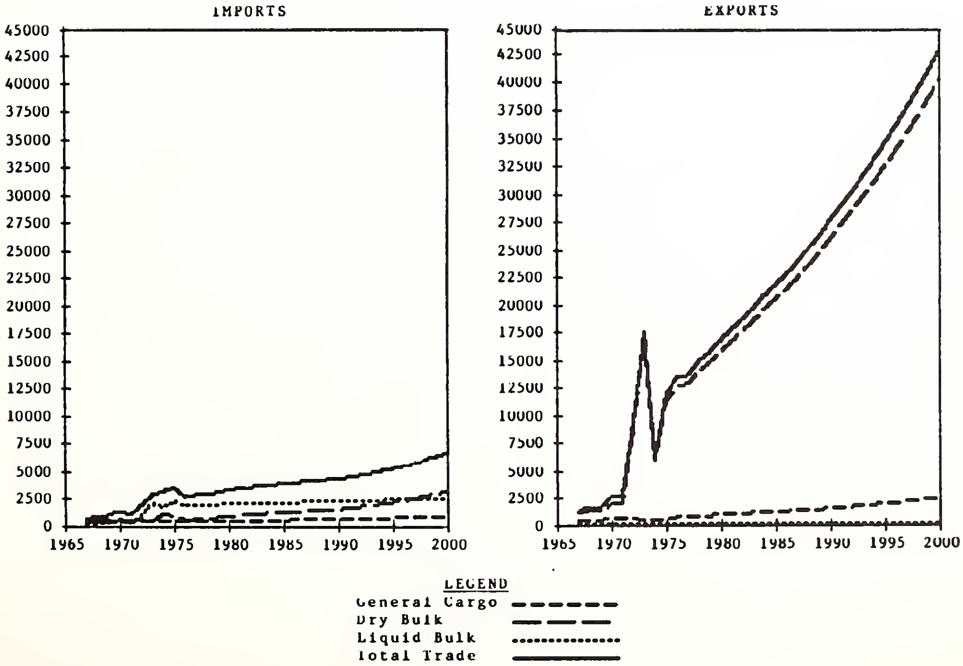
REGION 17
COMMUNIST ASIA
FORECAST SUMMARY

(000 Long Tons)



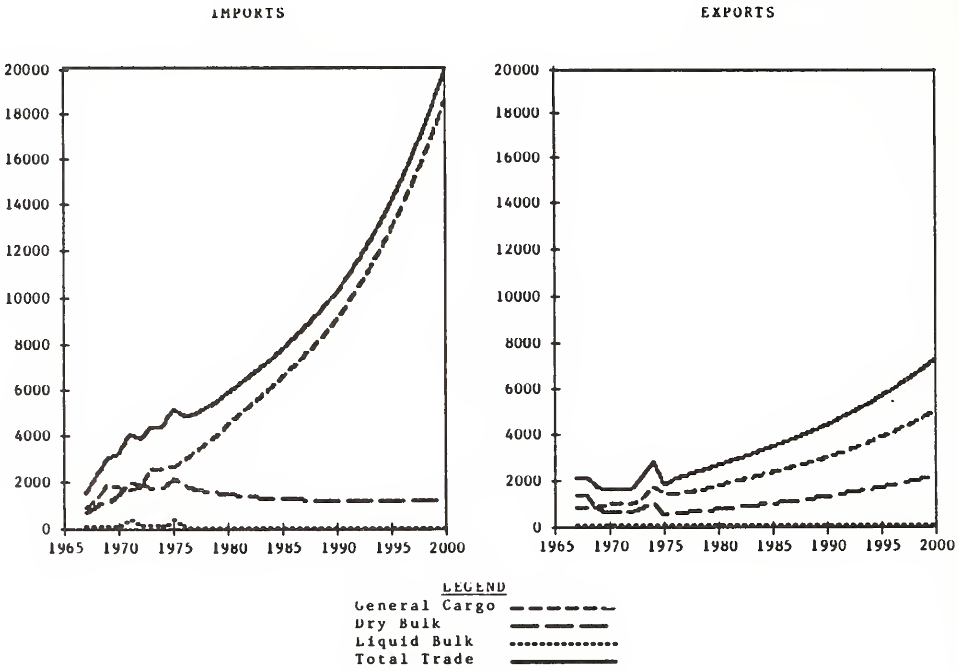
REGION 18
COMMUNIST EUROPE
FORECAST SUMMARY

(000 Long Tons)



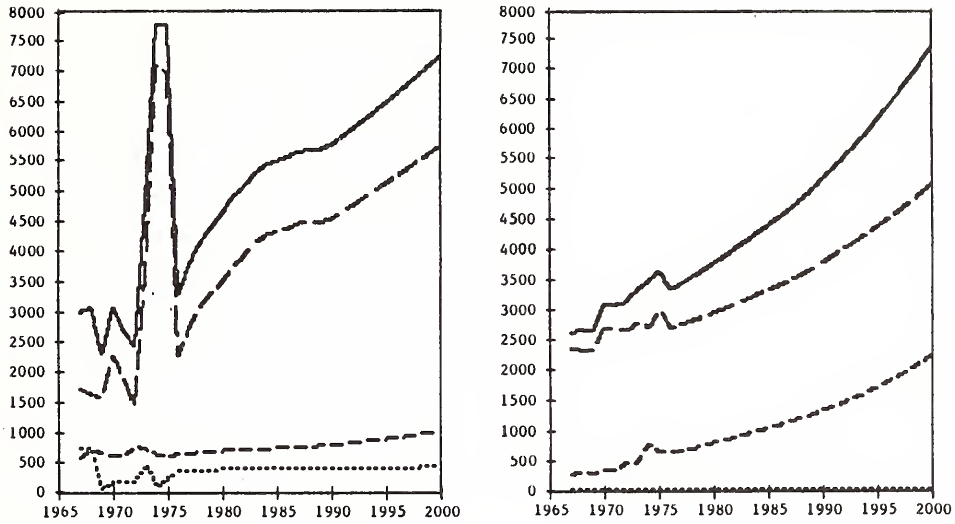
REGION 19
AUSTRALIA AND OCEANIA
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 01
US ATL/EAST COAST SOUTH AMERICA
FORECAST SUMMARY

(000 Long Tons)

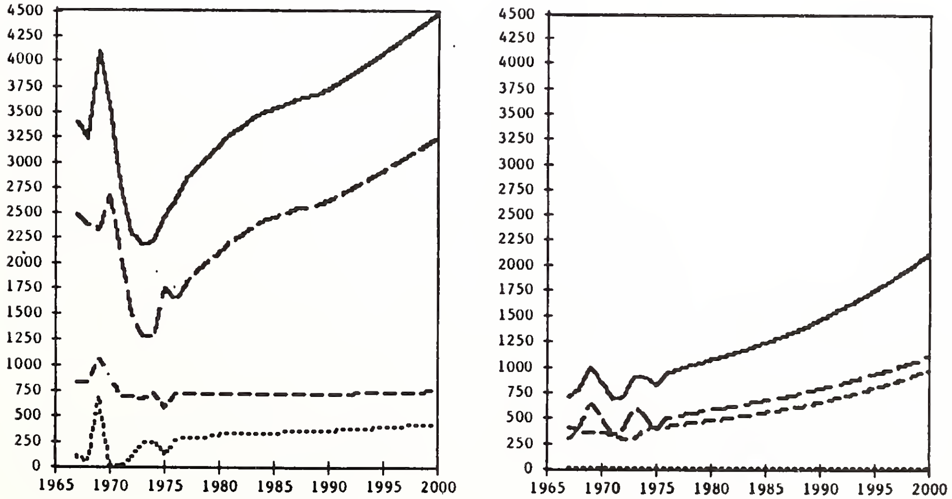


IMPORTS

EXPORTS

TRADE ROUTE 02
US ATL/WEST COAST SOUTH AMERICA
FORECAST SUMMARY

(000 Long Tons)



IMPORTS

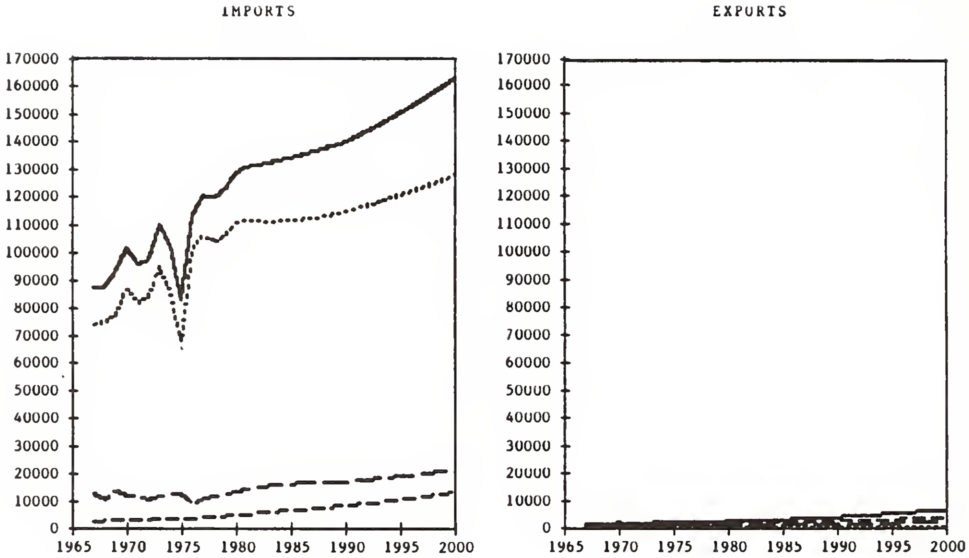
EXPORTS

LEGEND

General Cargo — — — — — —
Dry Bulk — — —
Liquid Bulk ··············
Total Trade ———

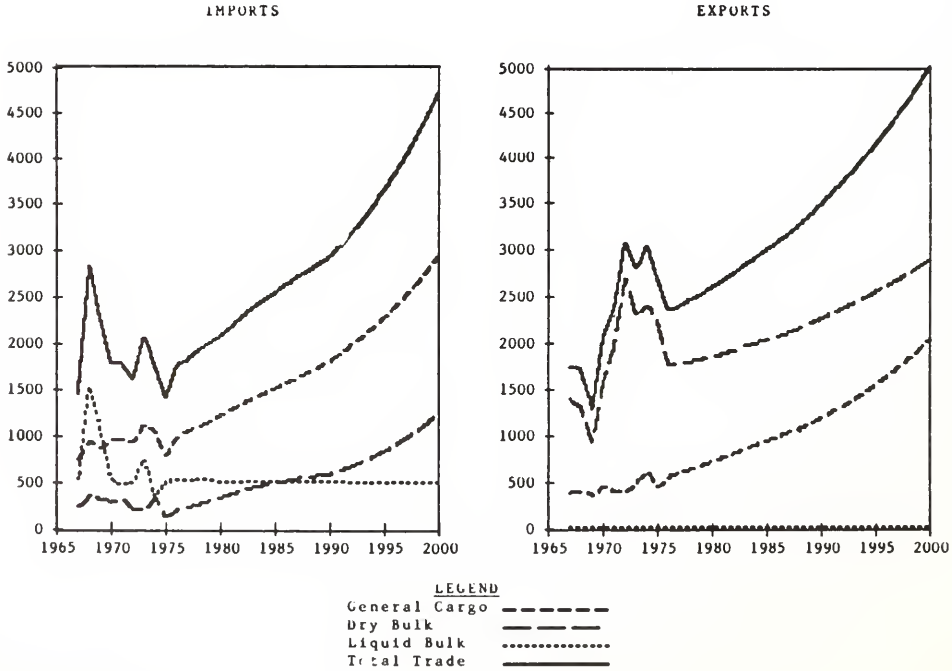
TRADE ROUTE 04
US ATL/CARIBBEAN,EAST COAST MEXICO
FORECAST SUMMARY

(000 Long Tons)



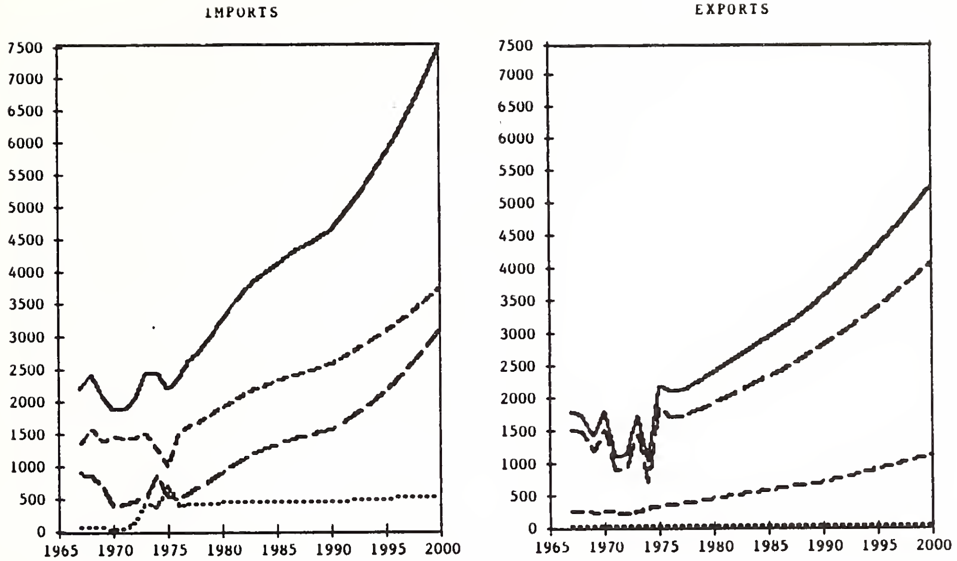
TRADE ROUTE 05
US N ATL/UNITED KINGDOM,IRELAND
FORECAST SUMMARY

(000 Long Tons)



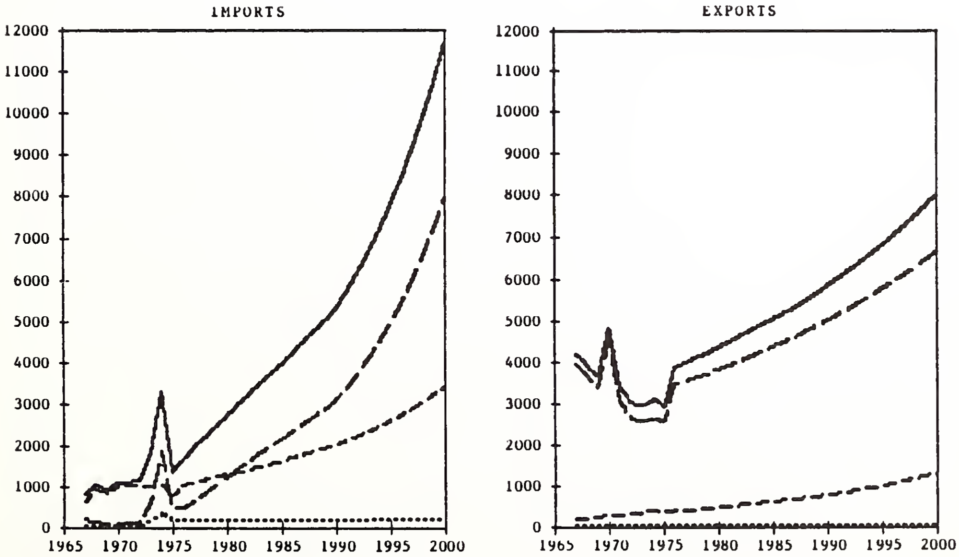
TRADE ROUTE 06
US N ATL/SCAND & BALTIC,NFLD,GRNLD,ICLD
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 07
US N ATL/WEST GERMANY(NORTH SEA)
FORECAST SUMMARY

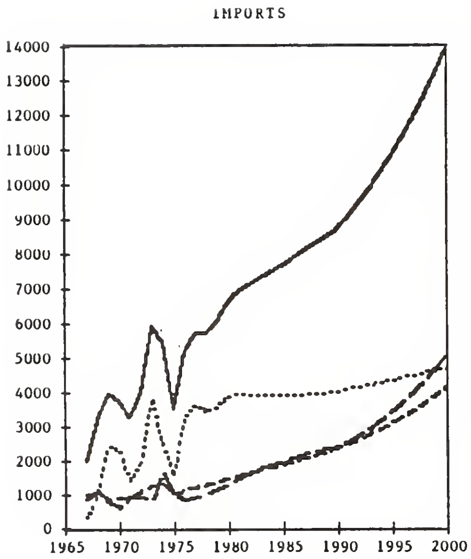
(000 Long Tons)



LEGEND
General Cargo - - - - - -
Dry Bulk — — —
Liquid Bulk ....
Total Trade ————

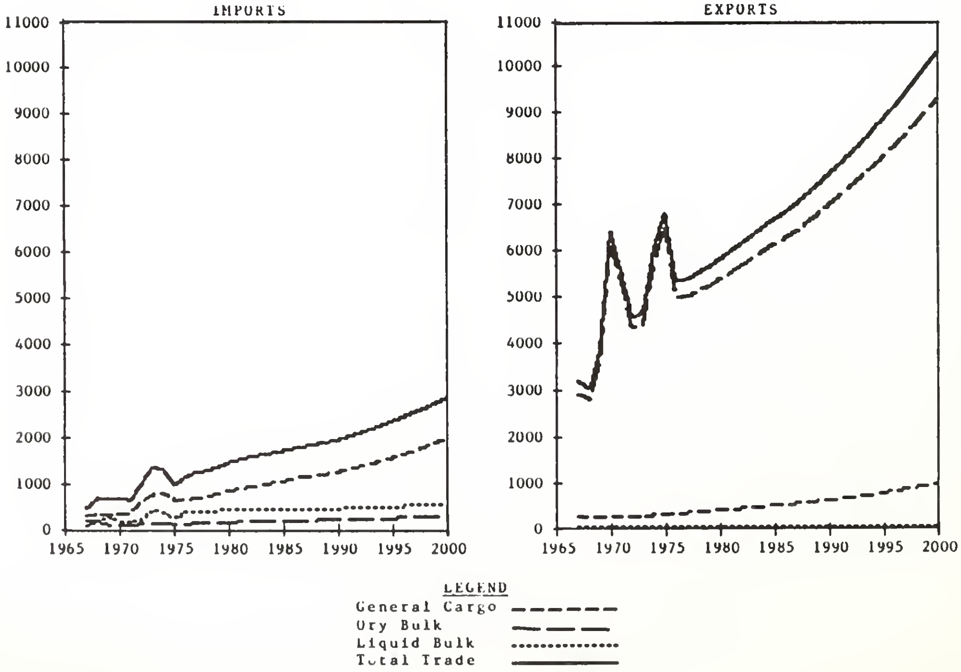
TRADE ROUTE 08
US N ATL/NETHERLANDS,BELGIUM
FORECAST SUMMARY

(000 Long Tons)



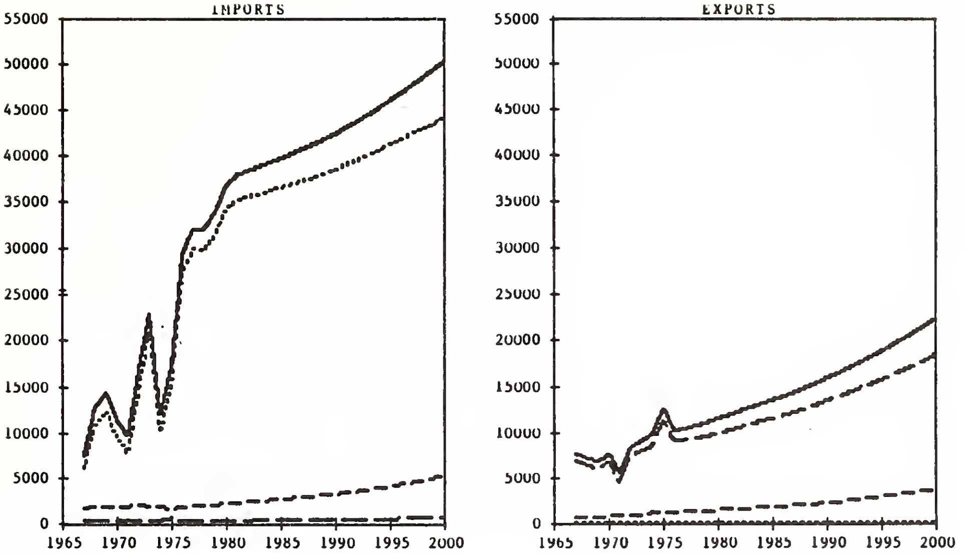
TRADE ROUTE 09
US N ATL/FRANCE(ATL),SPAIN(N OF PTGL)
FORECAST SUMMARY

(000 Long Tons)



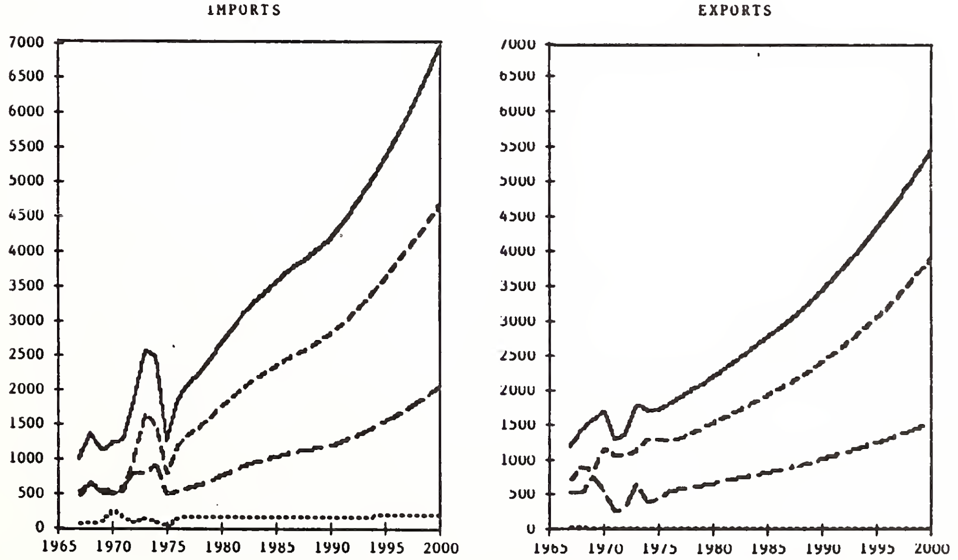
TRADE ROUTE 10
US N ATL/MED(BLACK SEA THROUGH AZORES)
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 11
US S ATL/UK,IRELD,CONT EUROPE(N OF PTGL)
FORECAST SUMMARY

(000 Long Tons)

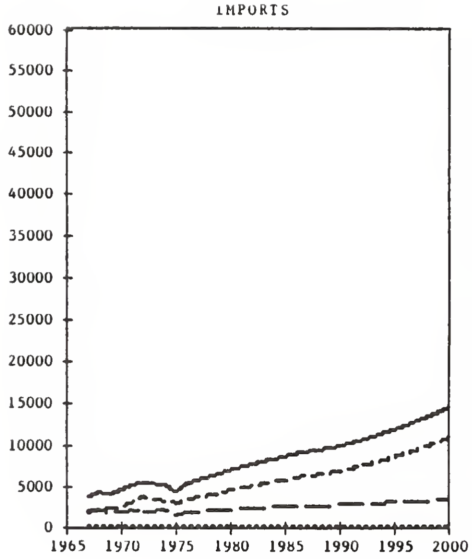


LEGEND

General Cargo – – – – – –
Dry Bulk — — —
Liquid Bulk ••••••••••••••
Total Trade ————

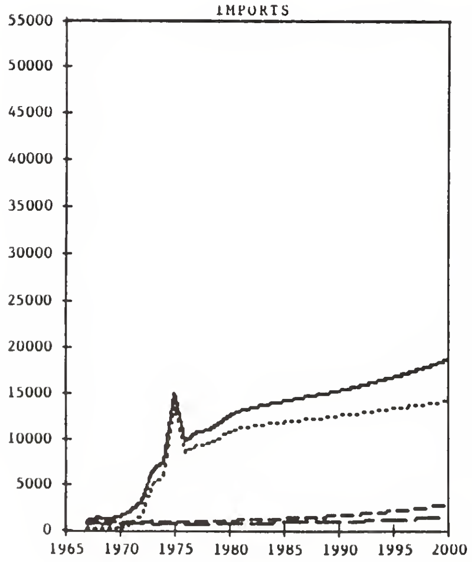
TRADE ROUTE 12
US ATL/FAR EAST
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 13
US S ATL & GLF/MED(BLACK SEA TO AZORES)
FORECAST SUMMARY

(000 Long Tons)

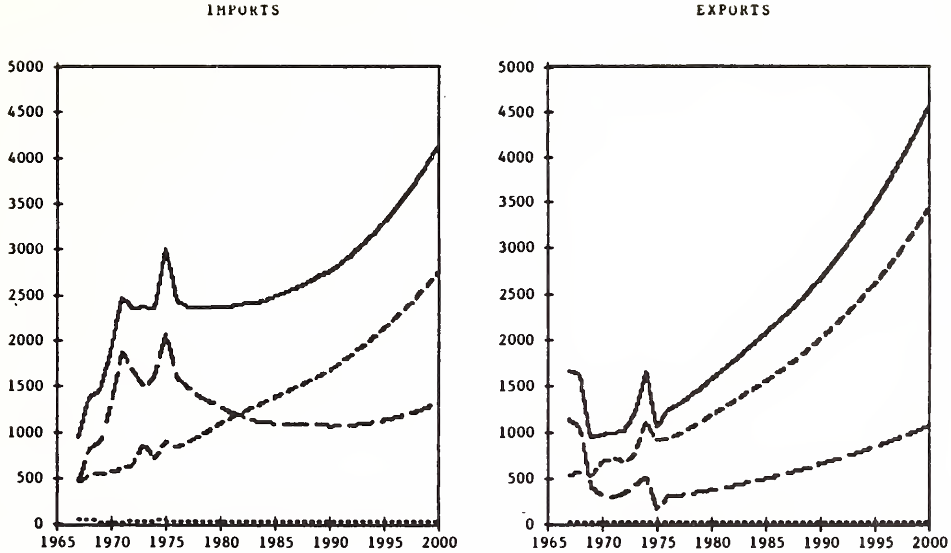


LEGEND

General Cargo – – – – – –
Dry Bulk — — —
Liquid Bulk ·············
Total Trade ———

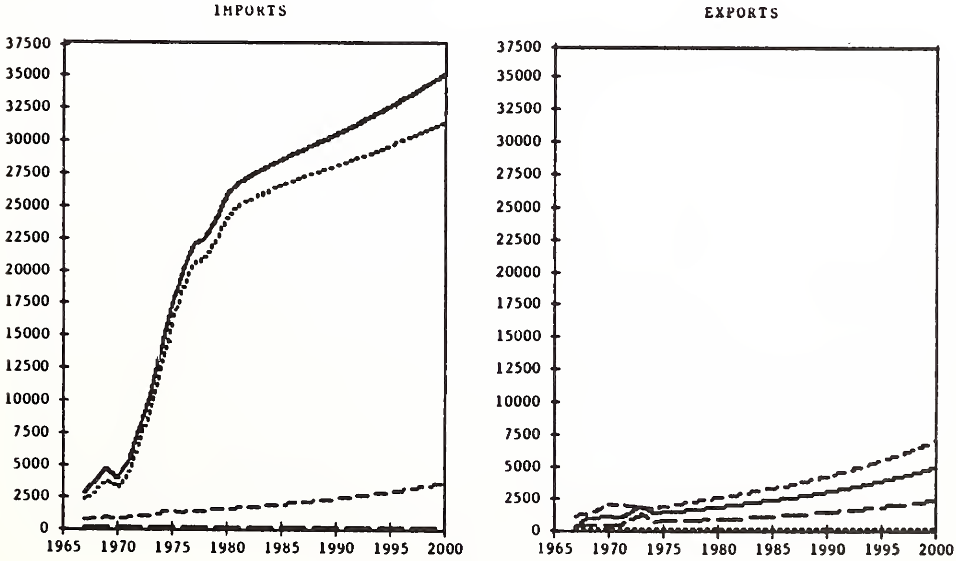
TRADE ROUTE 16
US ATL & GLF/AUSTRALASIA
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 17
US ATL, GLF & PAC/INDONESIA, MALAYSIA, SING
FORECAST SUMMARY

(000 Long Tons)

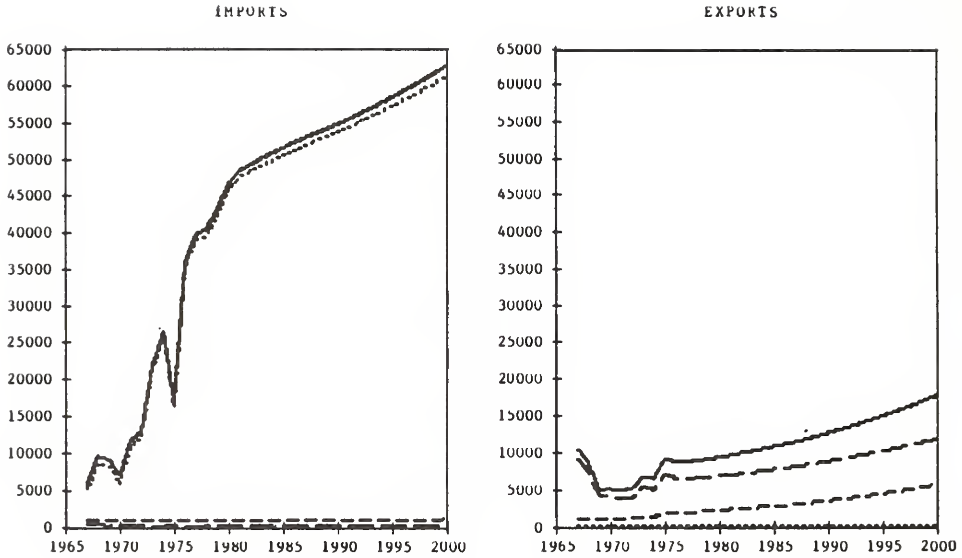


LEGEND

General Cargo - - - - - -
Dry Bulk — — —
Liquid Bulk ....
Total Trade ————

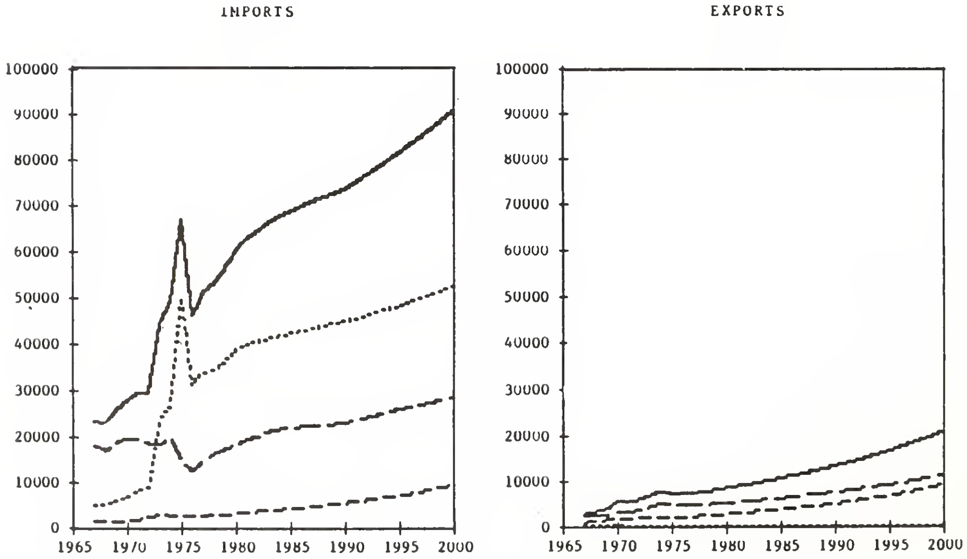
TRADE ROUTE 18
US ATL & GLF/IND,PAK,SRI,BUR,PRS G-RED S
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 19
US GLF/CARIBBEAN,EAST COAST MEXICO
FORECAST SUMMARY

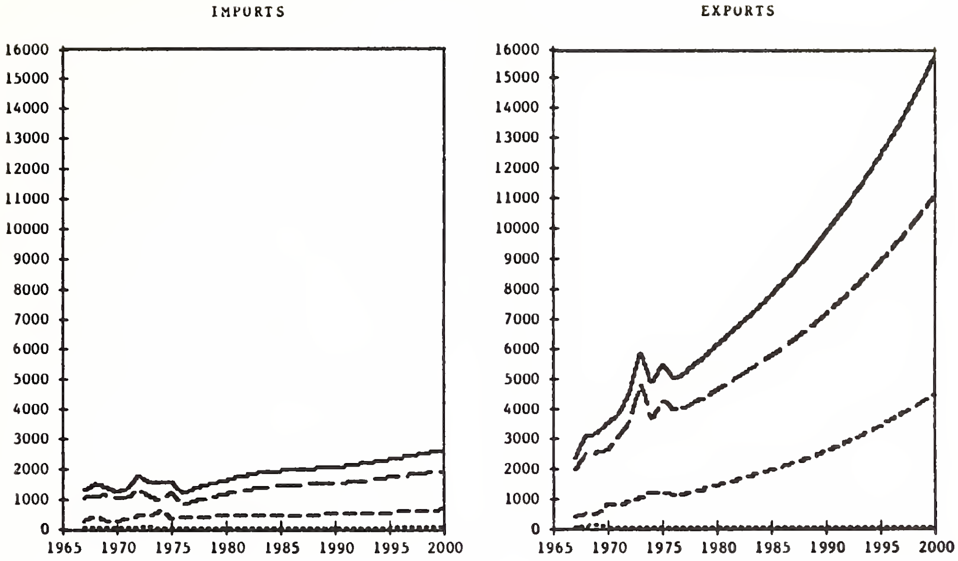
(000 Long Tons)



LEGEND
General Cargo – – – – – –
Dry Bulk — — —
Liquid Bulk ··············
Total Trade ————

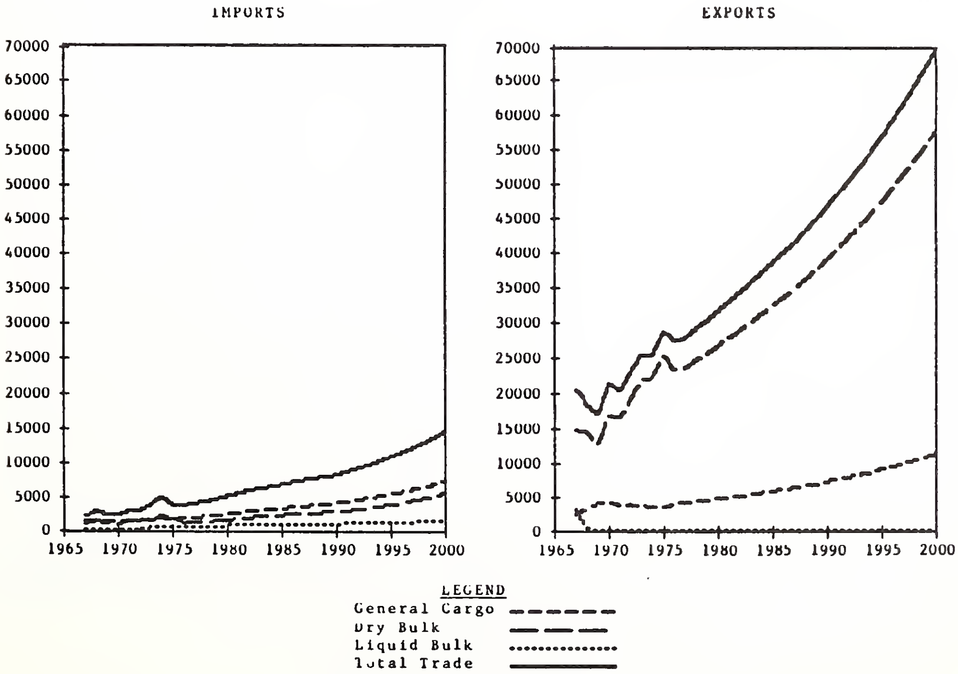
TRADE ROUTE 20
US GLF/EAST COAST SOUTH AMERICA
FORECAST SUMMARY

(000 Long Tons)



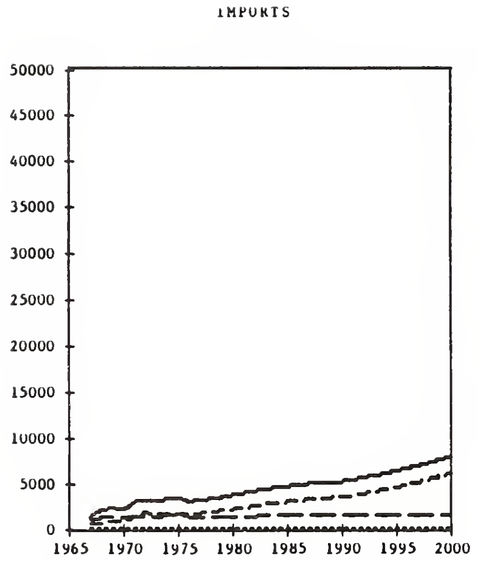
TRADE ROUTE 21
US GLF/UK, IRELND, CONTL EUROPE(N OF PTGL)
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 22
US GLF/FAR EAST
FORECAST SUMMARY

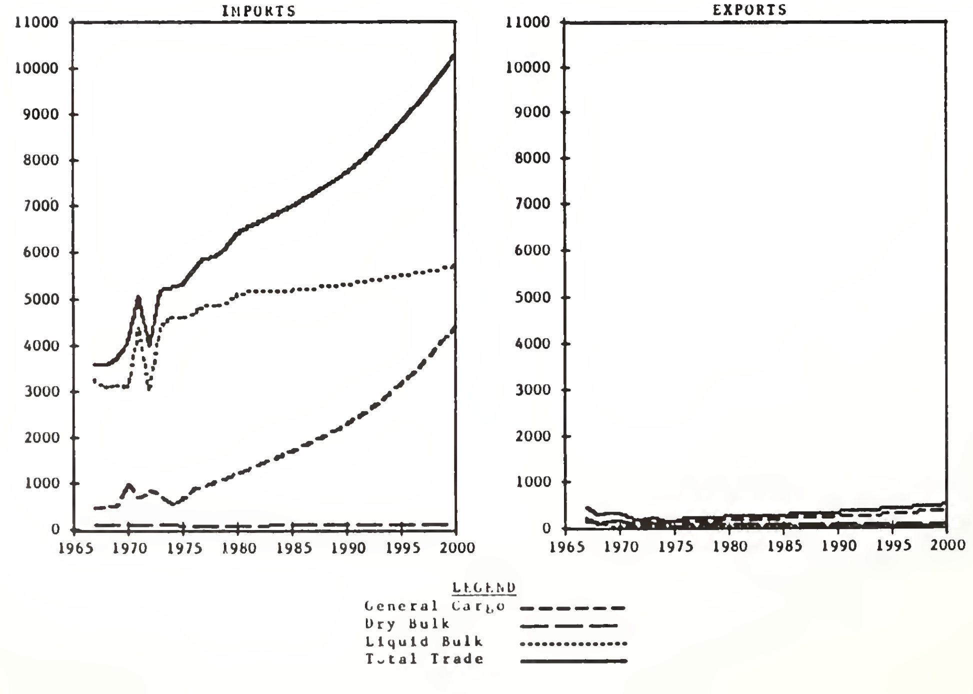
(000 Long Tons)


IMPORTS

EXPORTS

TRADE ROUTE 23
US PAC/CARIBBEAN,EAST COAST MEXICO
FORECAST SUMMARY

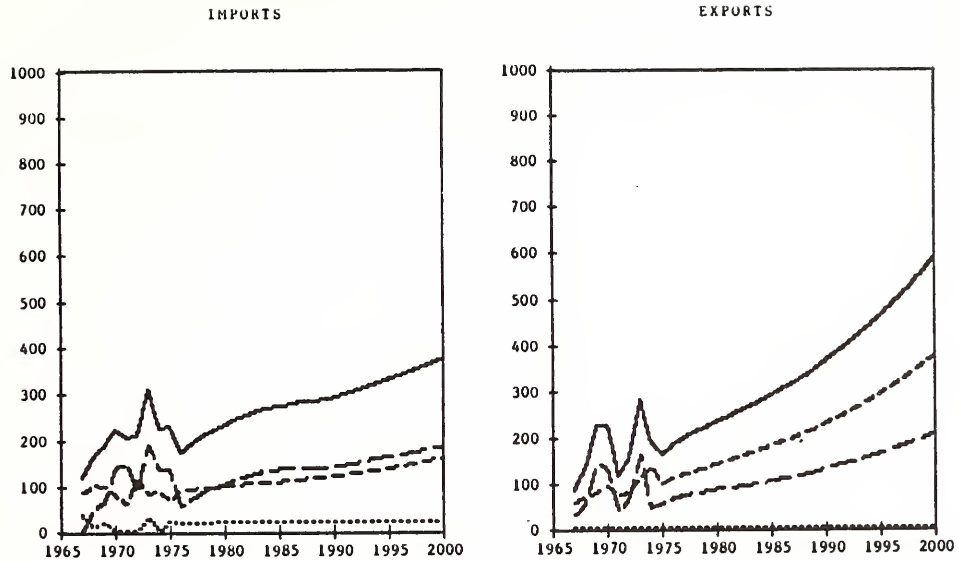
(000 Long Tons)


IMPORTS

EXPORTS

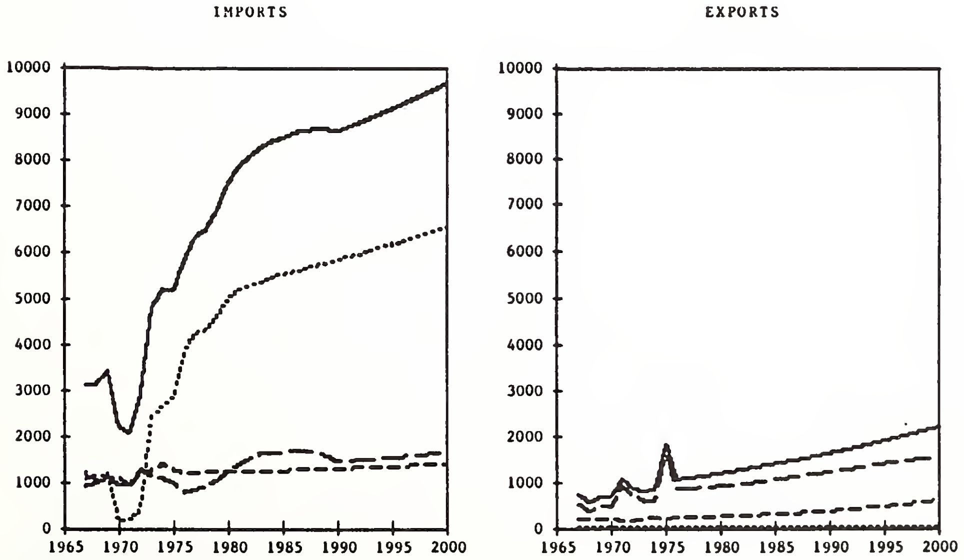
TRADE ROUTE 24
US PAC/EAST COAST SOUTH AMERICA
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 25
US PAC/W CST S AMER,CEN AMER,MEX,CANAL Z
FORECAST SUMMARY

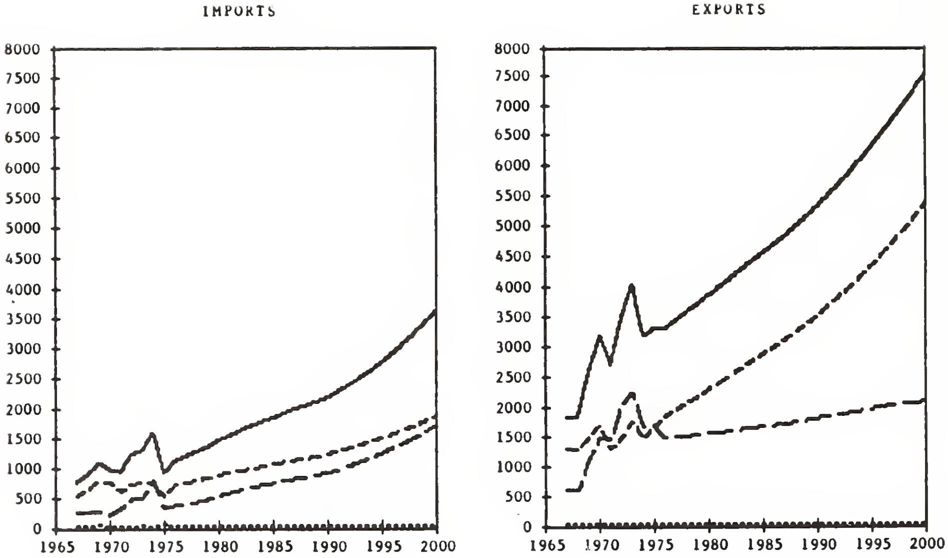
(000 Long Tons)



LEGEND
General Cargo - - - - - -
Dry Bulk — — —
Liquid Bulk ....
Total Trade ———

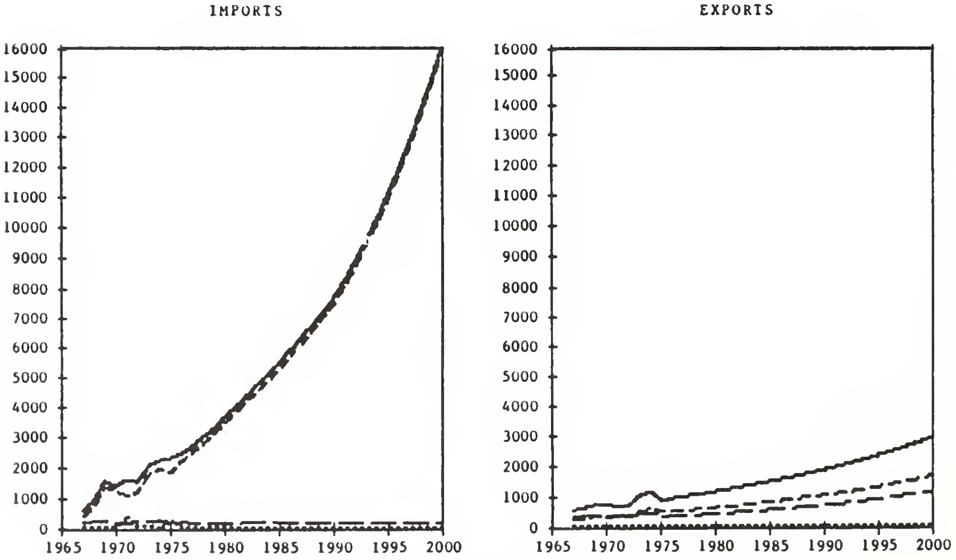
TRADE ROUTE 26
US PAC, HAW & ALAS/UK, IRELAND, CONT EUROPE
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 27
US PAC & HAW/AUSTRALASIA
FORECAST SUMMARY

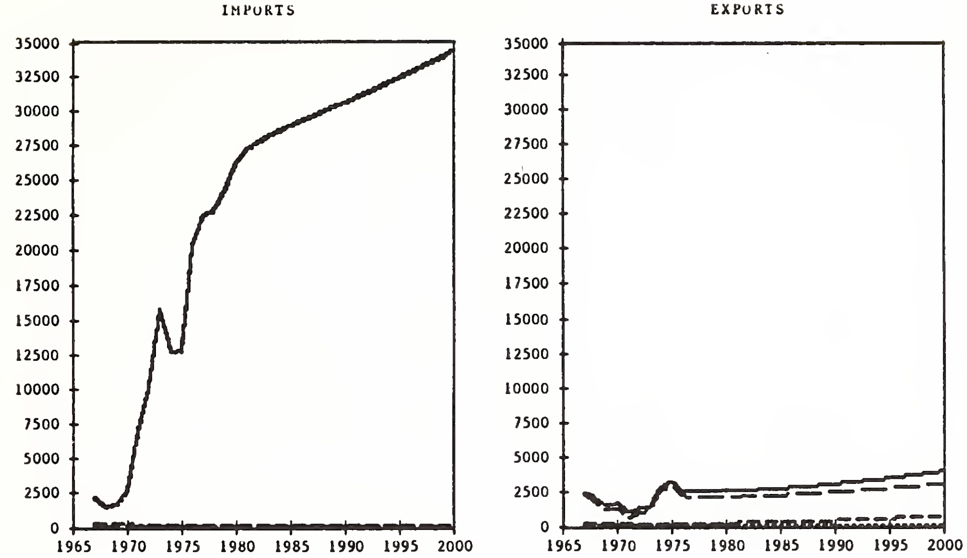
(000 Long Tons)



LEGEND
General Cargo - - - - - -
Dry Bulk — — — —
Liquid Bulk ....
Total Trade ———————

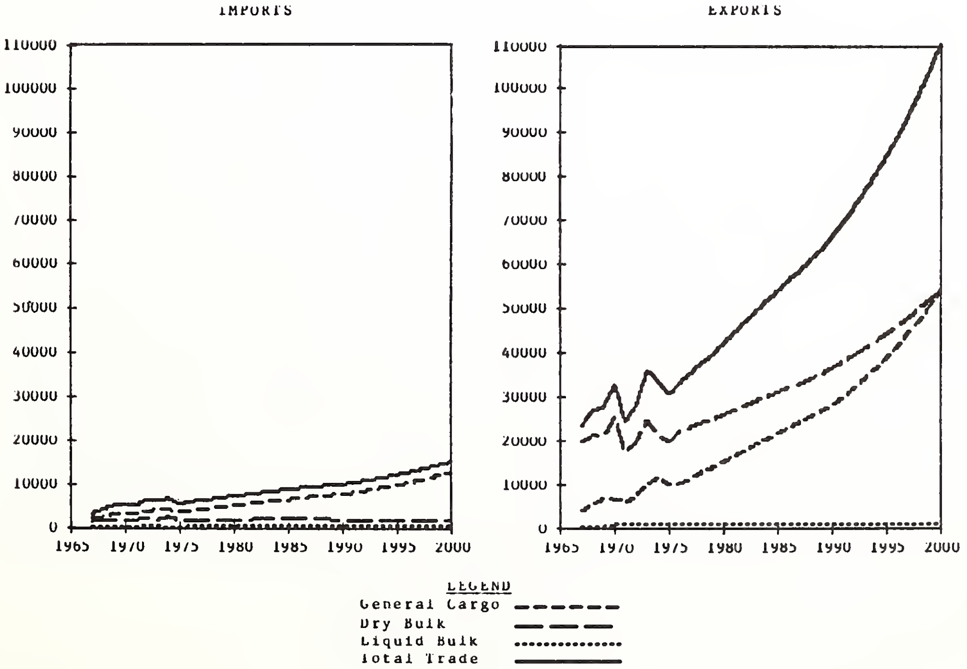
TRADE ROUTE 28
US PAC/INDIA,PAK,SRI L,BURM,PERS G-RED S
FORECAST SUMMARY

(000 Long Tons)



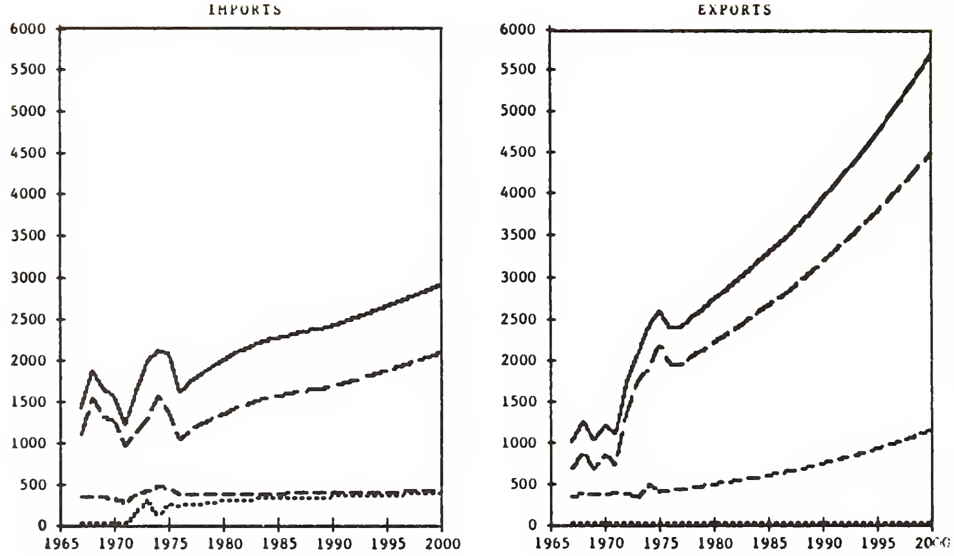
TRADE ROUTE 29
US PAC,HAW & ALAS/FAR EAST
FORECAST SUMMARY

(000 Long Tons)



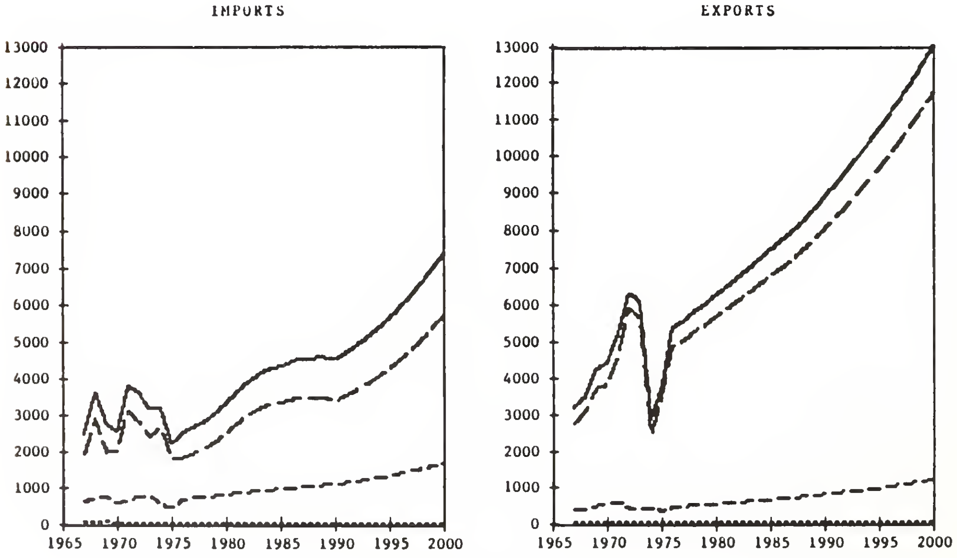
TRADE ROUTE 31
US GLF/WEST COAST SOUTH AMERICA
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 32
US GRT LKS/UK,IRELD,CONT EUR(N OF PTGL)
FORECAST SUMMARY

(000 Long Tons)

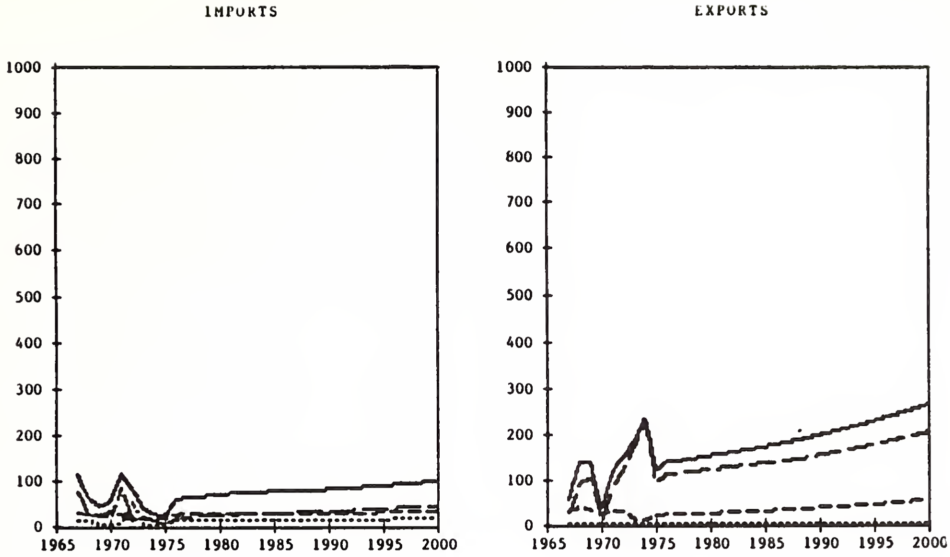


LEGEND

General Cargo – – – – –
Dry Bulk — — —
Liquid Bulk ....
Total Trade ———

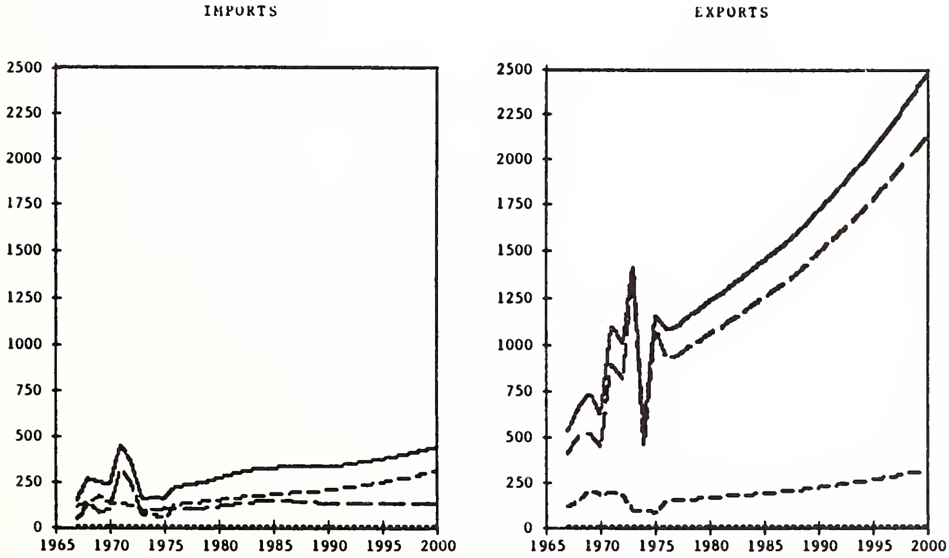
TRADE ROUTE 33
US GRT LKS/CARIBBEAN,EAST COAST MEXICO
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 34
US GRT LKS/MED(BLK SEA,PTGL,SPAIN,MOROC)
FORECAST SUMMARY

(000 Long Tons)

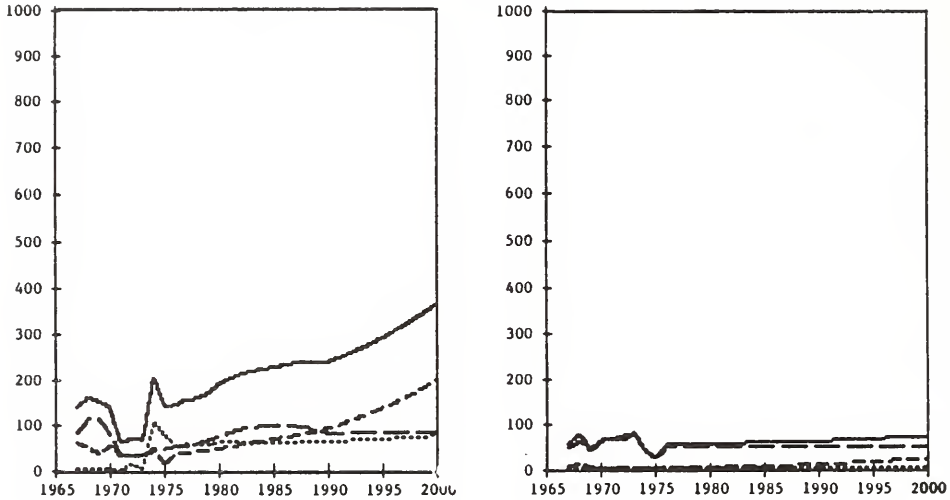


LEGEND

General Cargo	– – – – –
Dry Bulk	—— —— ——
Liquid Bulk	•••••••••••••
Total Trade	————————

TRADE ROUTE 35
US ATL/GREAT LAKES CANADA
FORECAST SUMMARY

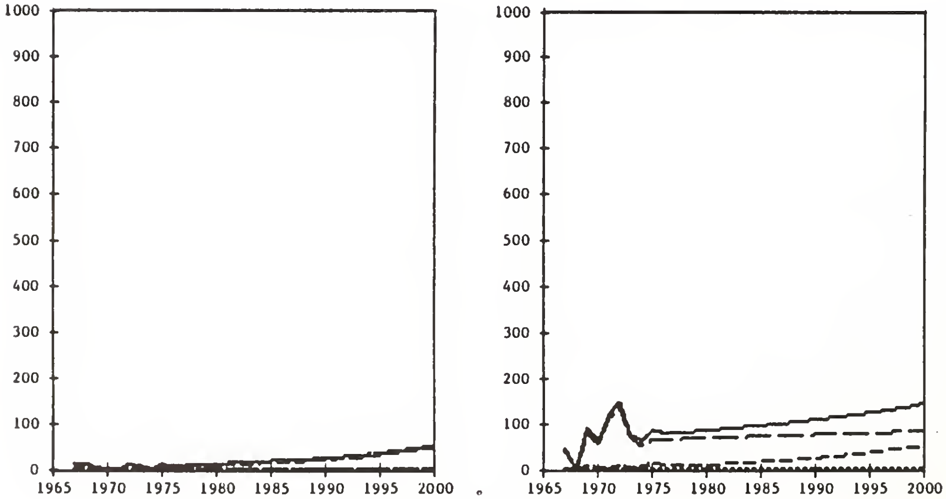
(000 Long Tons)


IMPORTS

EXPORTS

TRADE ROUTE 36
US GLF/GREAT LAKES CANADA
FORECAST SUMMARY

(000 Long Tons)

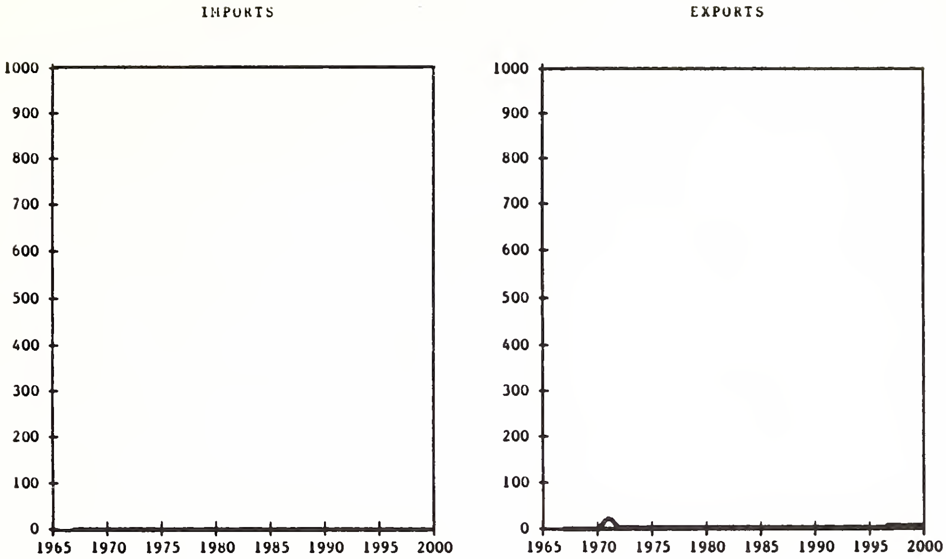

IMPORTS

EXPORTS

LEGEND
General Cargo - - - - - -
Dry Bulk — — —
Liquid Bulk ....
Total Trade ————

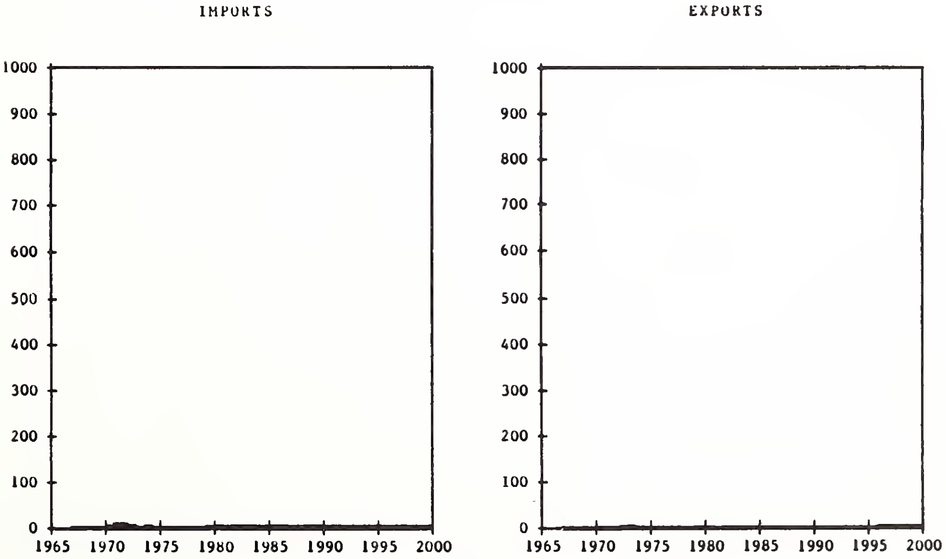
TRADE ROUTE 37
CALIF/GREAT LAKES CANADA
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 38
WASH & ORE/GREAT LAKES CANADA
FORECAST SUMMARY

(000 Long Tons)

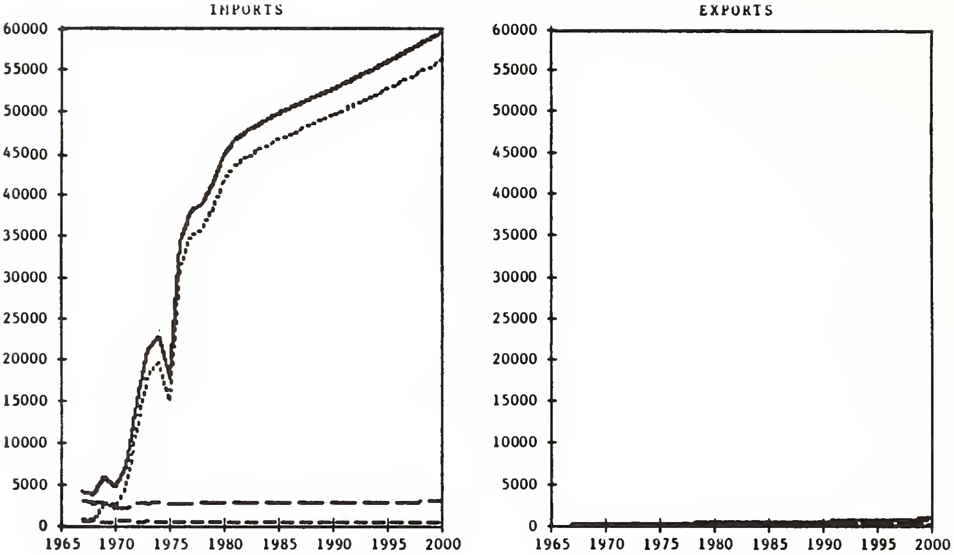


LEGEND

General Cargo	— — — — —
Dry Bulk	—— —— ——
Liquid Bulk	··············
Total Trade	————————

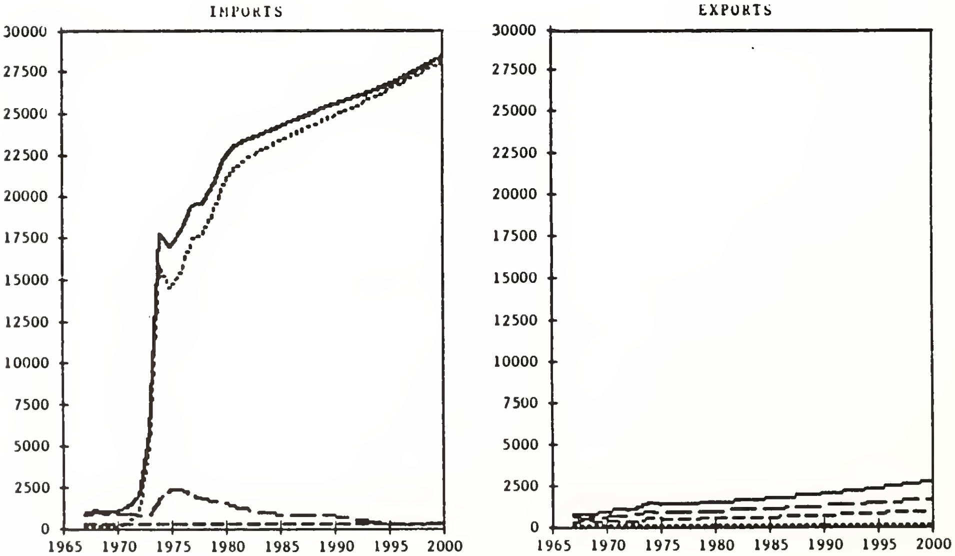
TRADE ROUTE 41
US ATL(SVC 1)/W AFRIC,CAN-C VRDE-MADR IS
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 42
US GLF(SVC 2)/W AFRICA,CAN-C VRD-MADR IS
FORECAST SUMMARY

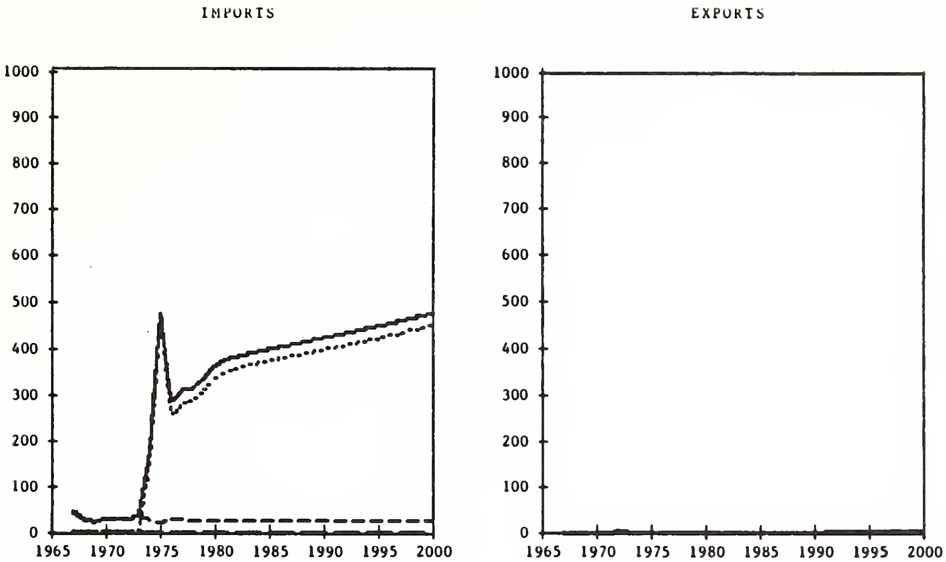
(000 Long Tons)



LEGEND
General Cargo — — — — —
Dry Bulk —— —— ——
Liquid Bulk ••••••••••••
Total Trade ————————

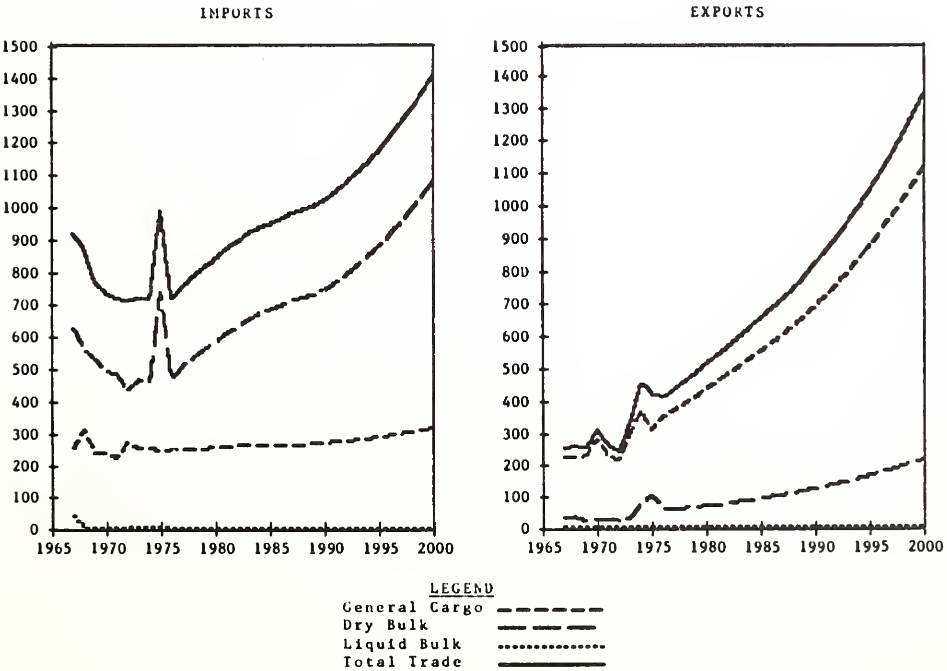
TRADE ROUTE 43
US PAC/W AFRICA,CANARY-C VERDE-MEDEIR IS
FORECAST SUMMARY

(000 Long Tons)



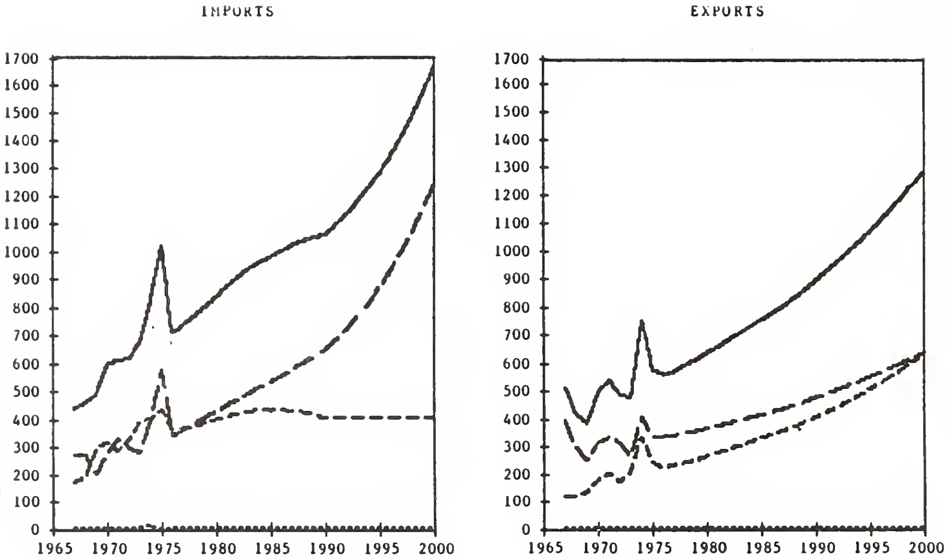
TRADE ROUTE 51
US ATL/S&E AFRIC,MLGSY REP,ST HEL-ASC IS
FORECAST SUMMARY

(000 Long Tons)



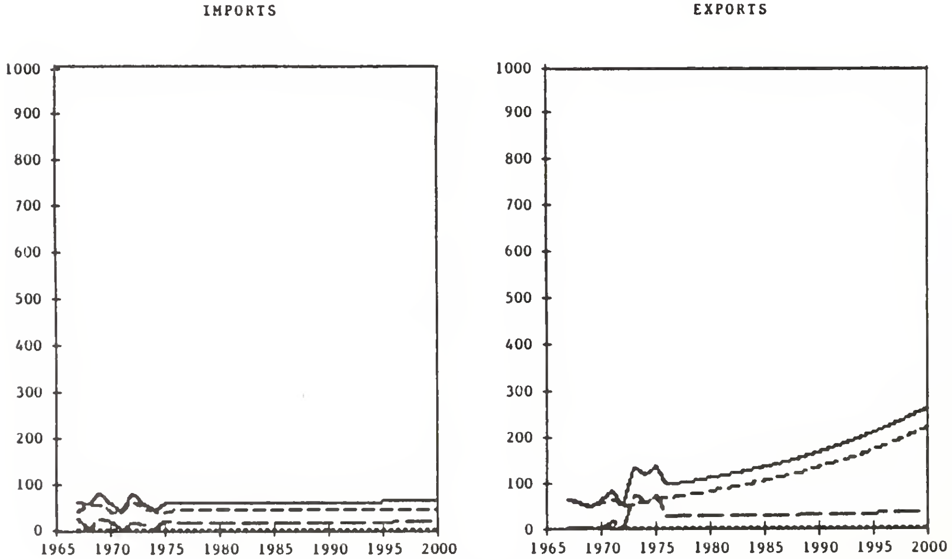
TRADE ROUTE 52
US GLF/S&E AFRIC,MLGSY REP,ST HEL-ASC IS
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 53
US PAC/S&E AFRIC,MLGSY REP,ST HEL-ASC IS
FORECAST SUMMARY

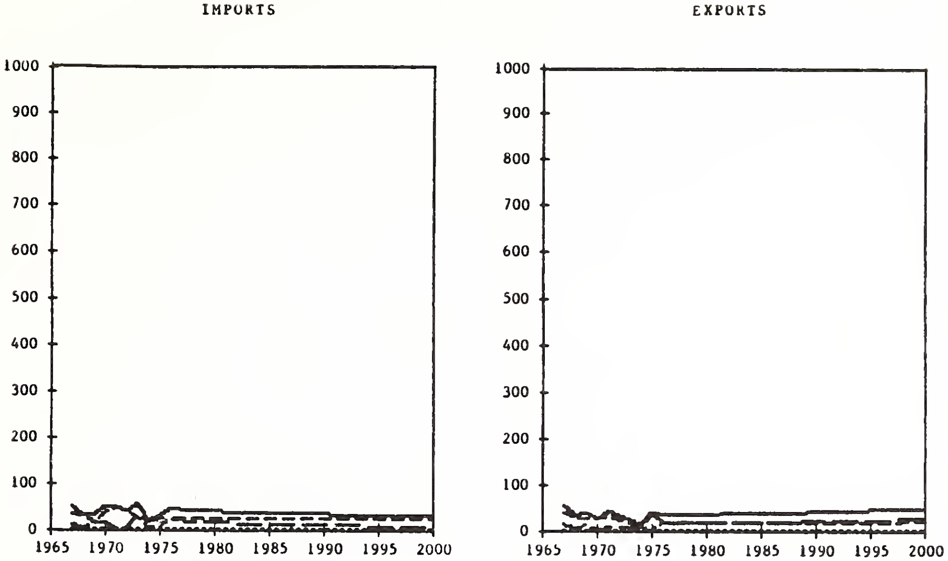
(000 Long Tons)



LEGEND
General Cargo – – – – –
Dry Bulk —— —— ——
Liquid Bulk ....
Total Trade ————

TRADE ROUTE 54
US GRT LKS/WEST AFRICA
FORECAST SUMMARY

(000 Long Tons)

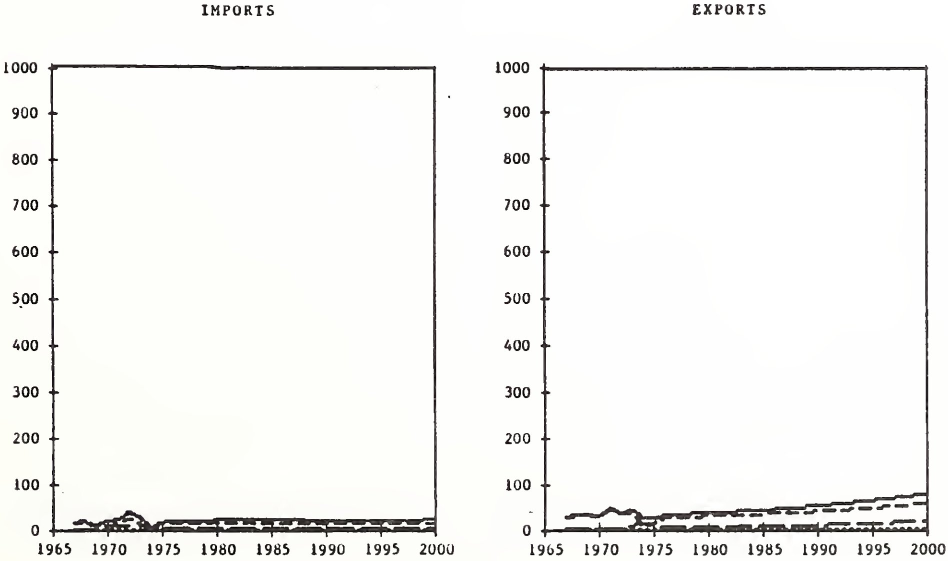


IMPORTS

EXPORTS

TRADE ROUTE 55
US GRT LKS/SOUTH & EAST AFRICA
FORECAST SUMMARY

(000 Long Tons)



IMPORTS

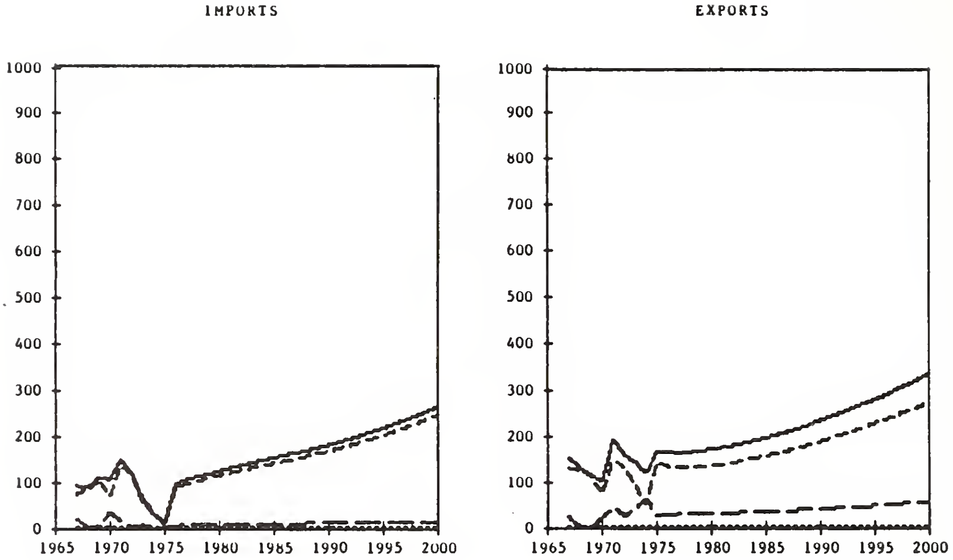
EXPORTS

LEGEND

General Cargo - - - - - -
Dry Bulk — — —
Liquid Bulk ··············
Total Trade ———

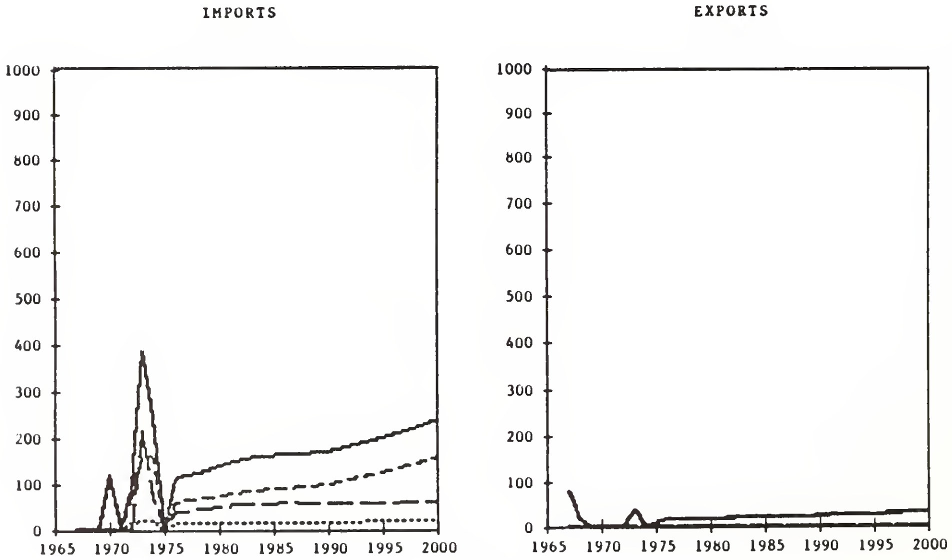
TRADE ROUTE 56
US GRT LKS/RED S,IND,PRS G,INDO,MAL,SING
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 58
US GRT LKS/PACIFIC CANADA
FORECAST SUMMARY

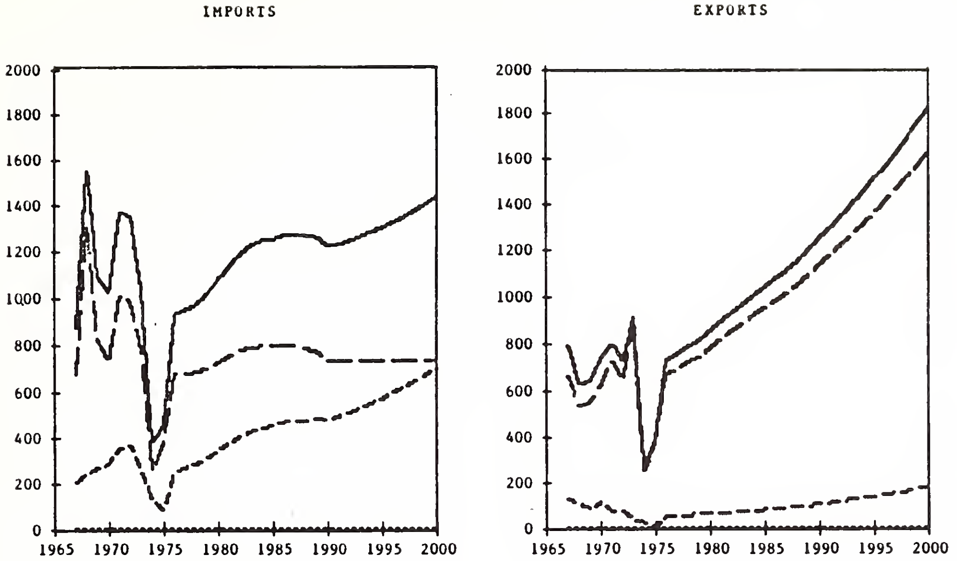
(000 Long Tons)



LEGEND
General Cargo - - - - - -
Dry Bulk — — —
Liquid Bulk ···············
Total Trade ————

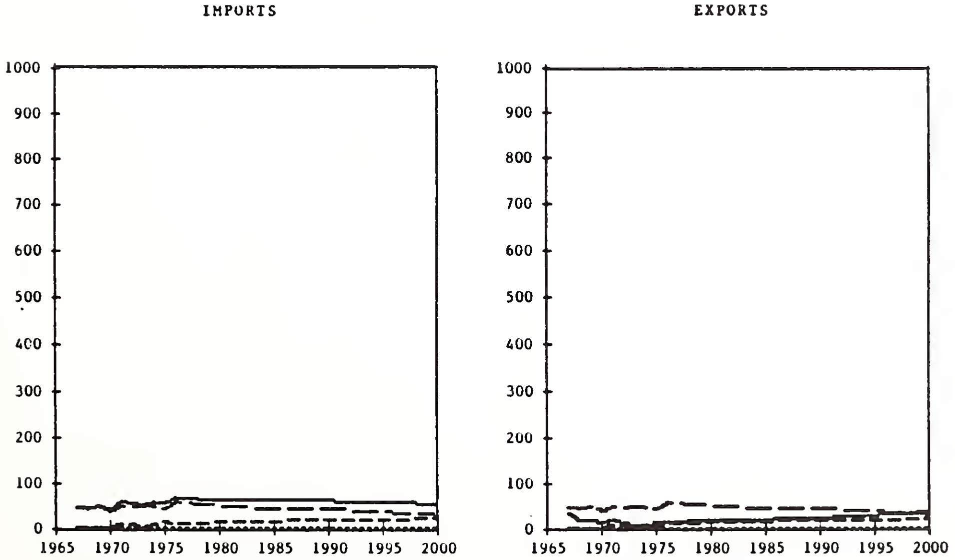
TRADE ROUTE 59
US GRT LKS/FAR EAST
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 60
US GRT LKS/AUSTRALASIA
FORECAST SUMMARY

(000 Long Tons)

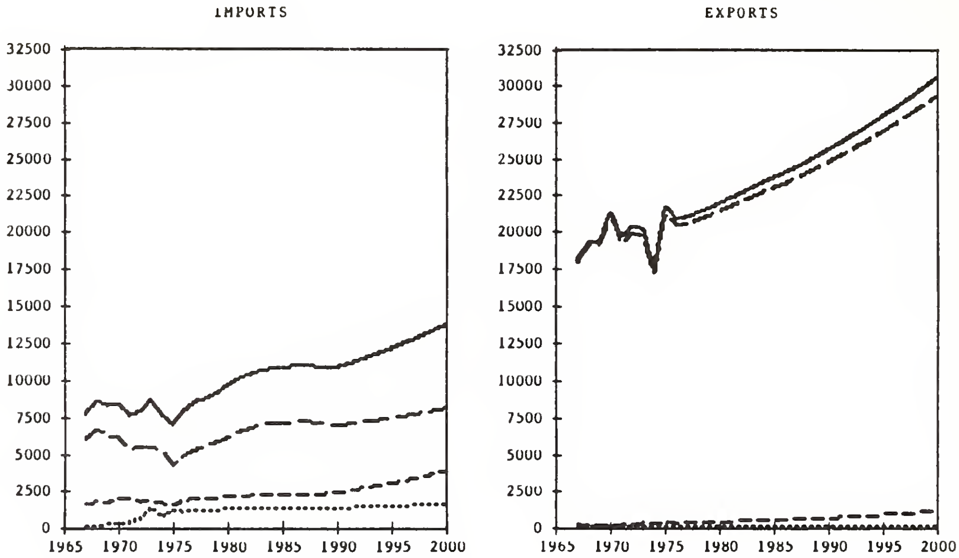


LEGEND

General Cargo — — — — —
Dry Bulk ——— ———
Liquid Bulk ....
Total Trade ————————

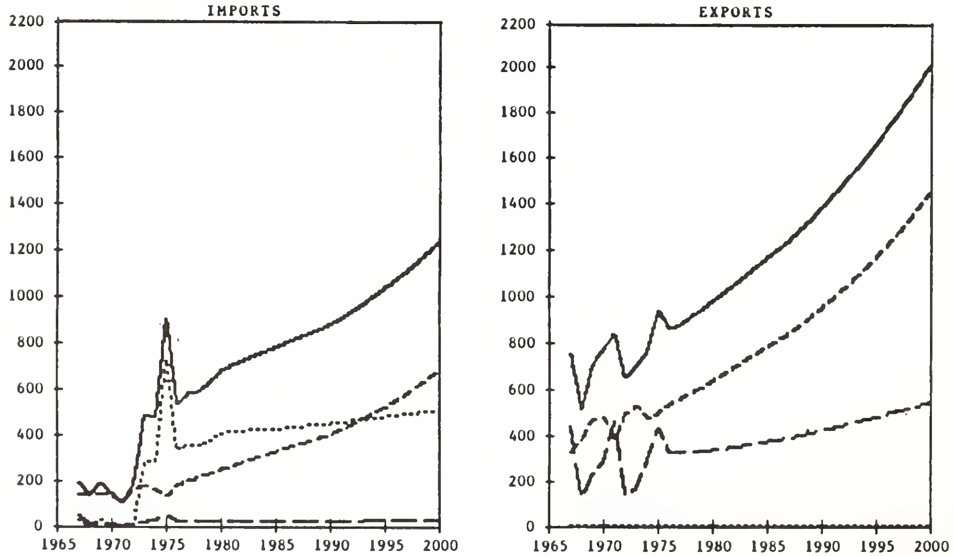
TRADE ROUTE 61
US GRT LKS/GREAT LAKES CANADA
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 65
US PAC/MED(BLACK SEA TROUGH AZORES)
FORECAST SUMMARY

(000 Long Tons)

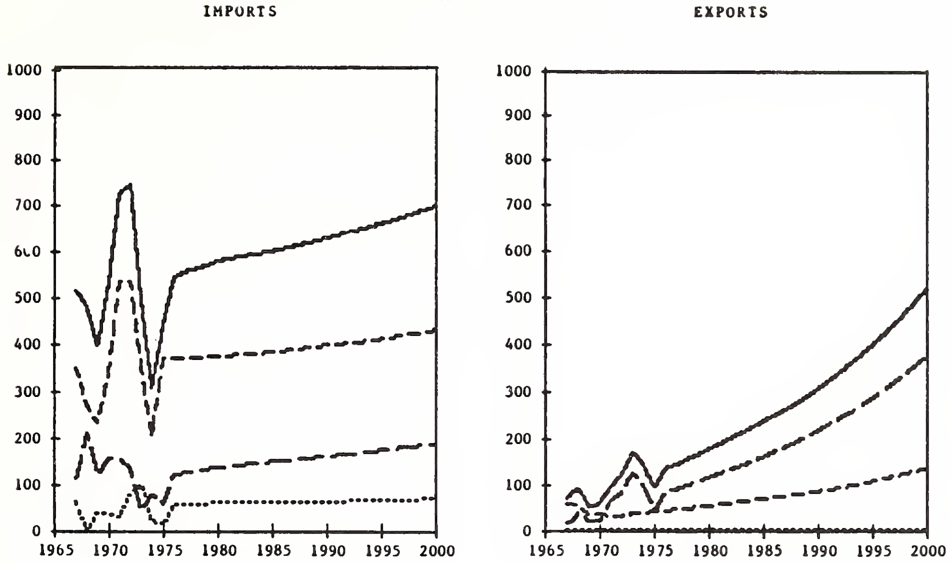


LEGEND

General Cargo — — — —
Dry Bulk —— —— ——
Liquid Bulk ··············
Total Trade ————

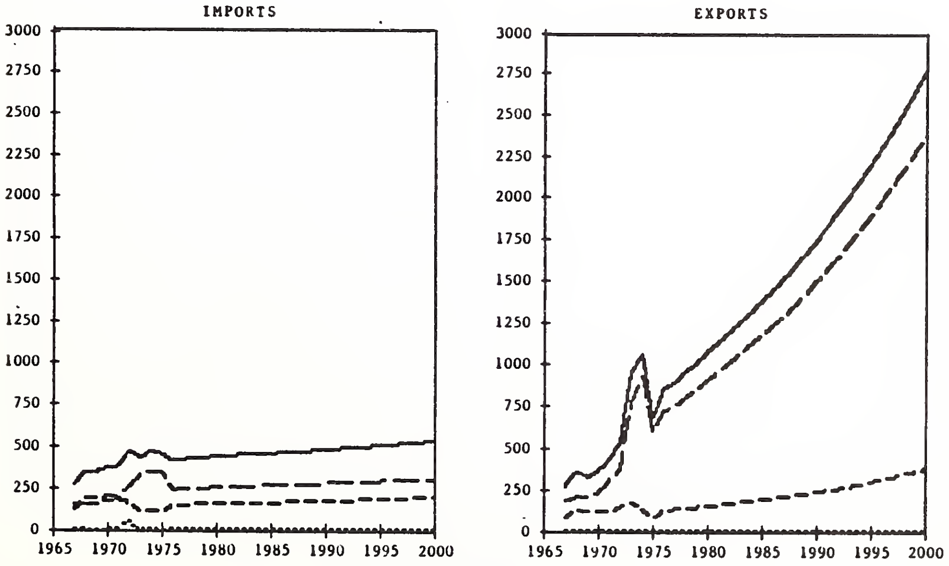
TRADE ROUTE 71
US ATL/WEST COAST CENTL AMERICA & MEXICO
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 72
US GLF/WEST COAST CENTL AMERICA & MEXICO
FORECAST SUMMARY

(000 Long Tons)

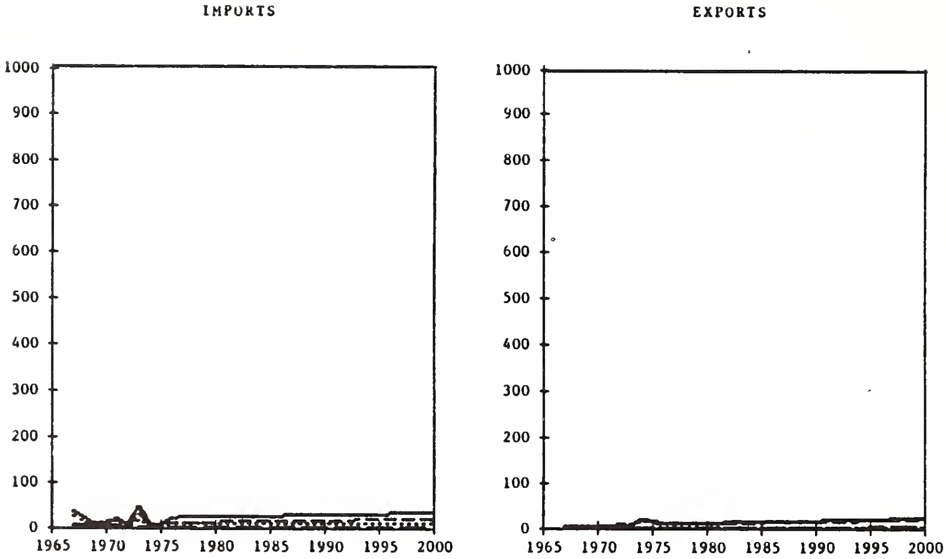


LEGEND

General Cargo	– – – – – –
Dry Bulk	— — —
Liquid Bulk	··············
Total Trade	————

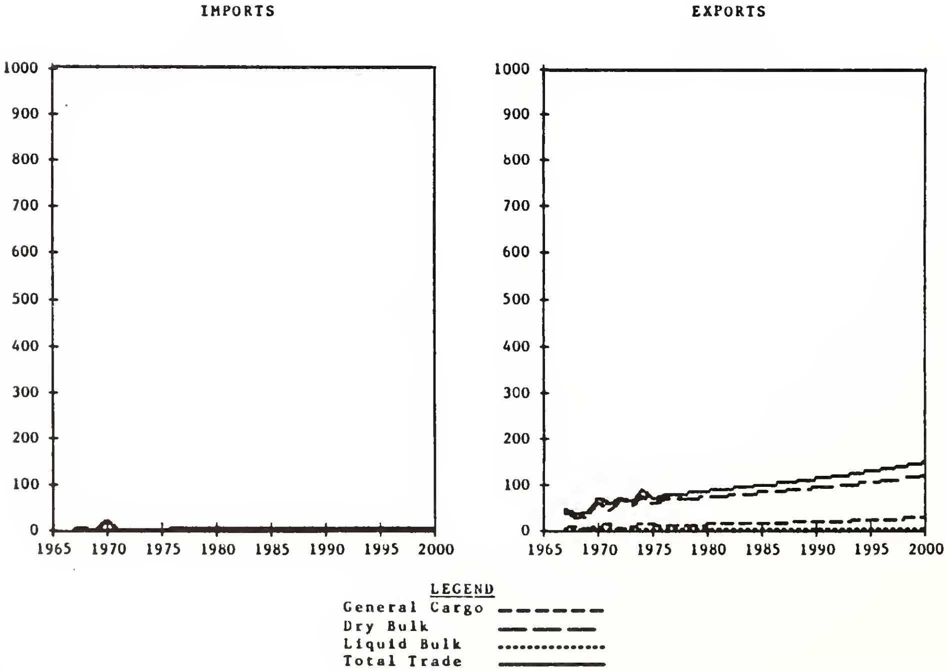
TRADE ROUTE 77
US ATL/PACIFIC CANAL ZONE
FORECAST SUMMARY

(000 Long Tons)



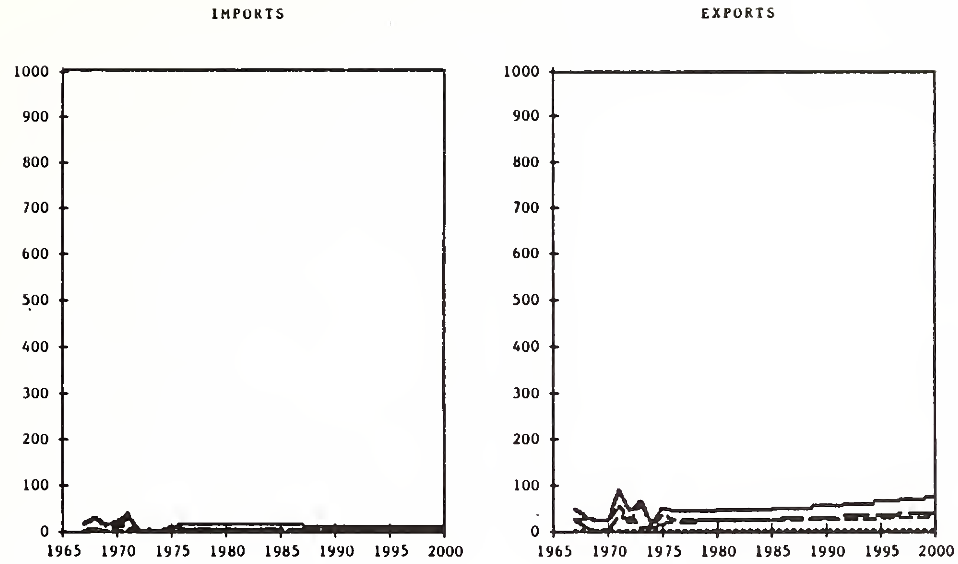
TRADE ROUTE 78
US GLF/PACIFIC CANAL ZONE
FORECAST SUMMARY

(000 Long Tons)



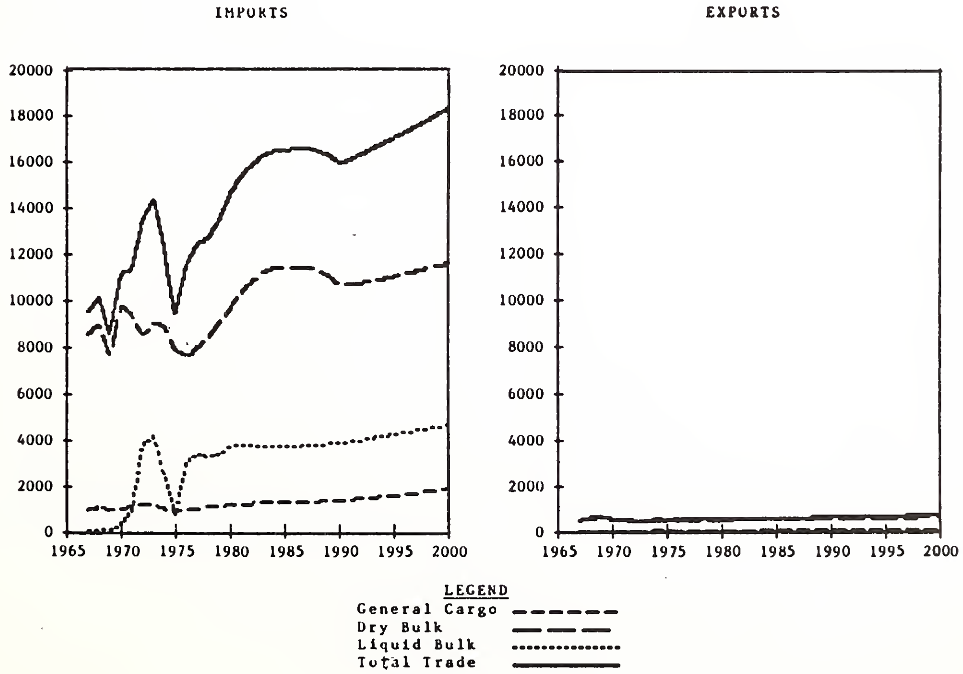
TRADE ROUTE 80
US GRT LKS/W COAST S AMER,CENT AMER,MEX
FORECAST SUMMARY

(000 Long Tons)



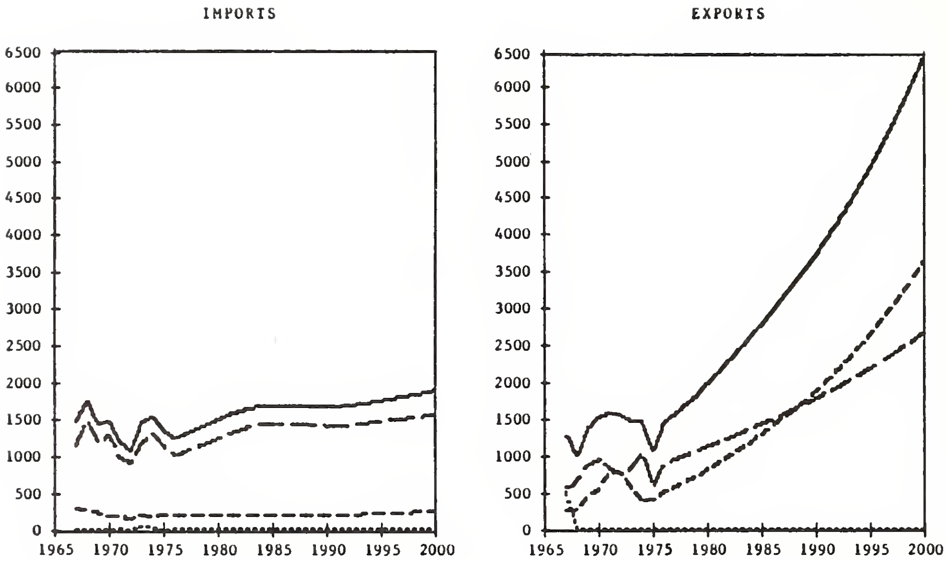
TRADE ROUTE 81
US ATL/ATLANTIC CANADA
FORECAST SUMMARY

(000 Long Tons)



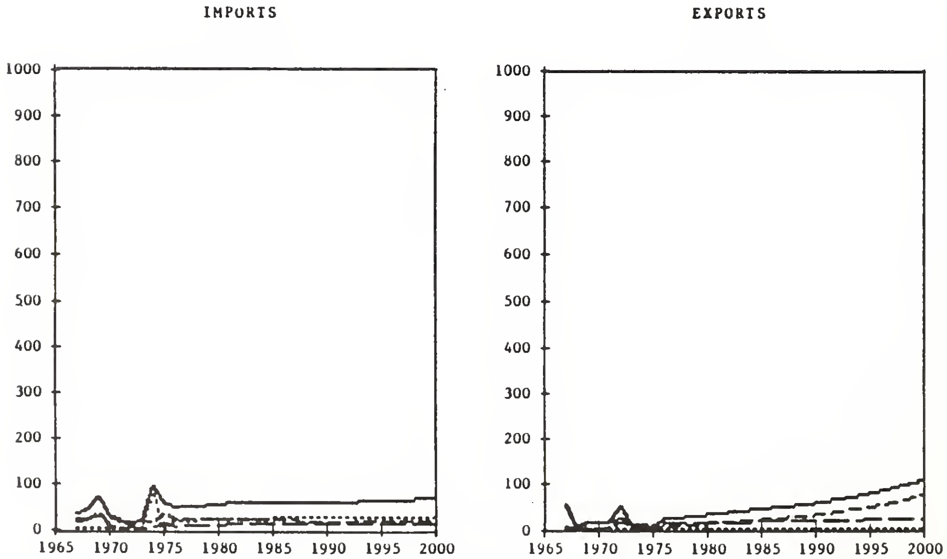
TRADE ROUTE 82
US GLF/ATLANTIC CANADA
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 83
US PAC/ATLANTIC CANADA
FORECAST SUMMARY

(000 Long Tons)

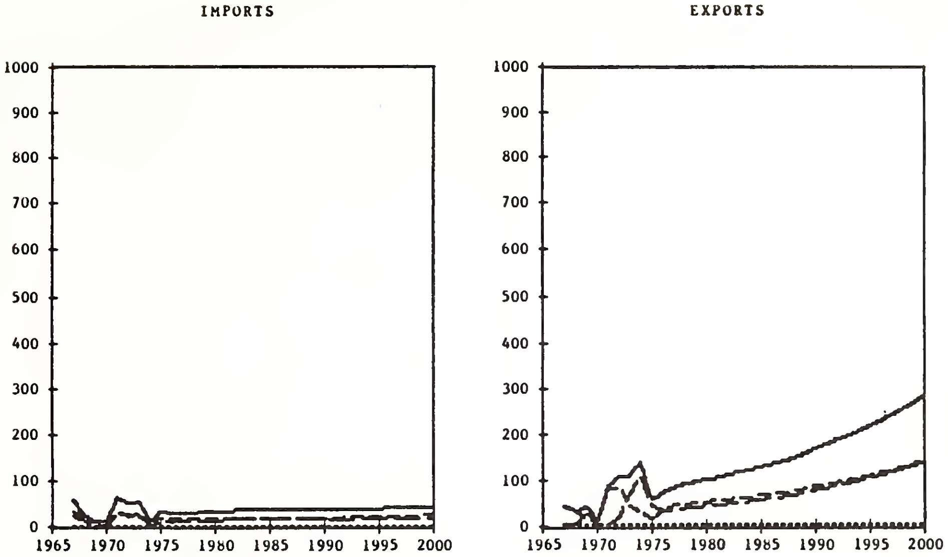


LEGEND

General Cargo – – – – – –
Dry Bulk — — —
Liquid Bulk ···············
Total Trade ————

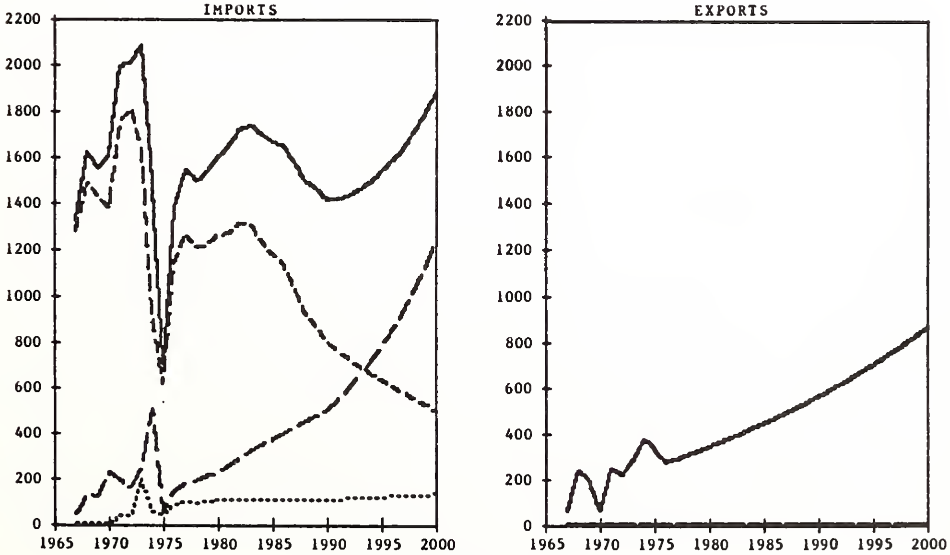
TRADE ROUTE 84
US GRT LKS/EAST COAST SOUTH AMERICA
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 85
US ATL/PACIFIC CANADA
FORECAST SUMMARY

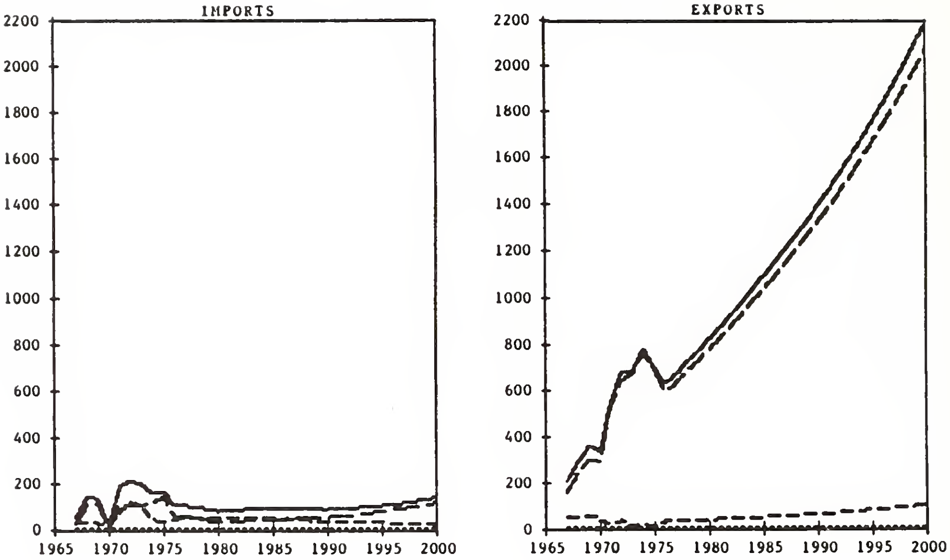
(000 Long Tons)



LEGEND
General Cargo - - - - - - -
Dry Bulk — — —
Liquid Bulk ....
Total Trade ———————

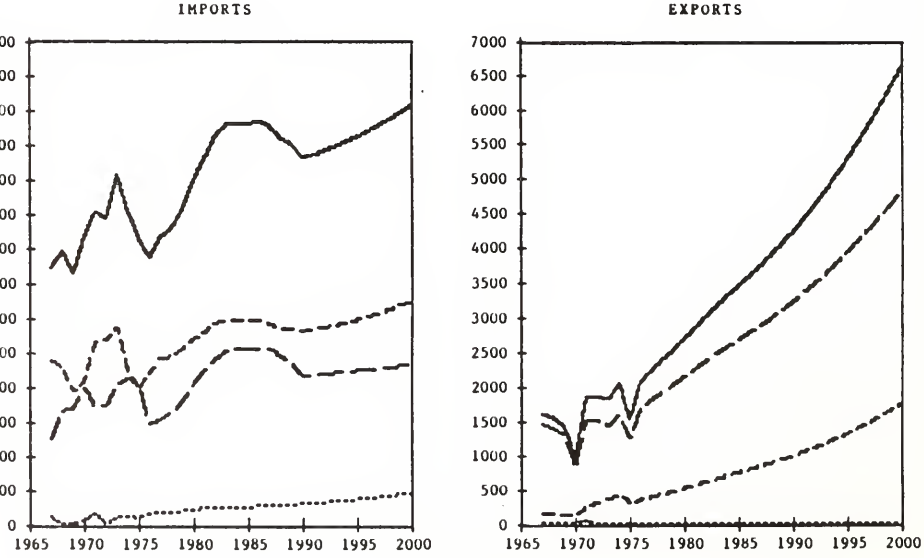
TRADE ROUTE 86
US GLF/PACIFIC CANADA
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 87
US PAC/PACIFIC CANADA
FORECAST SUMMARY

(000 Long Tons)

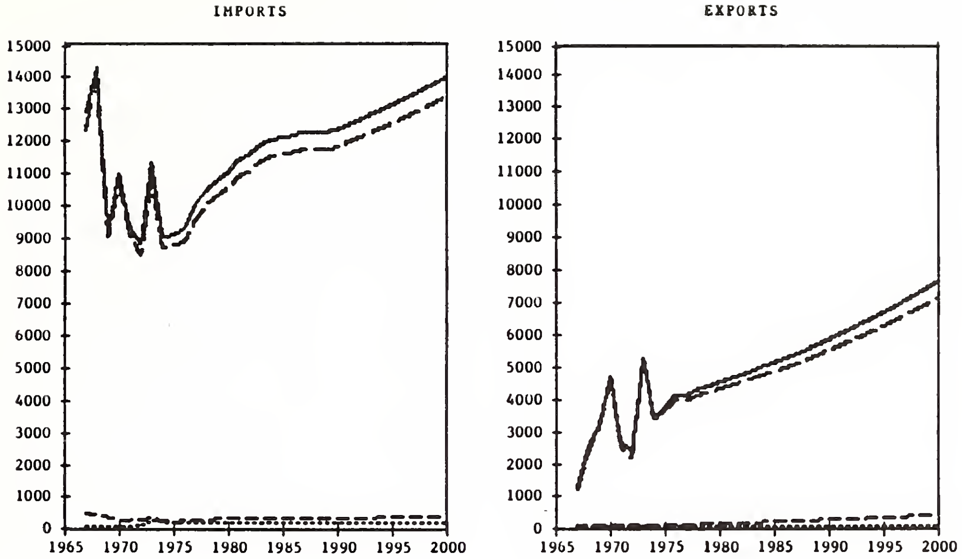


LEGEND

General Cargo – – – – –
Dry Bulk — — —
Liquid Bulk ··············
Total Trade ————

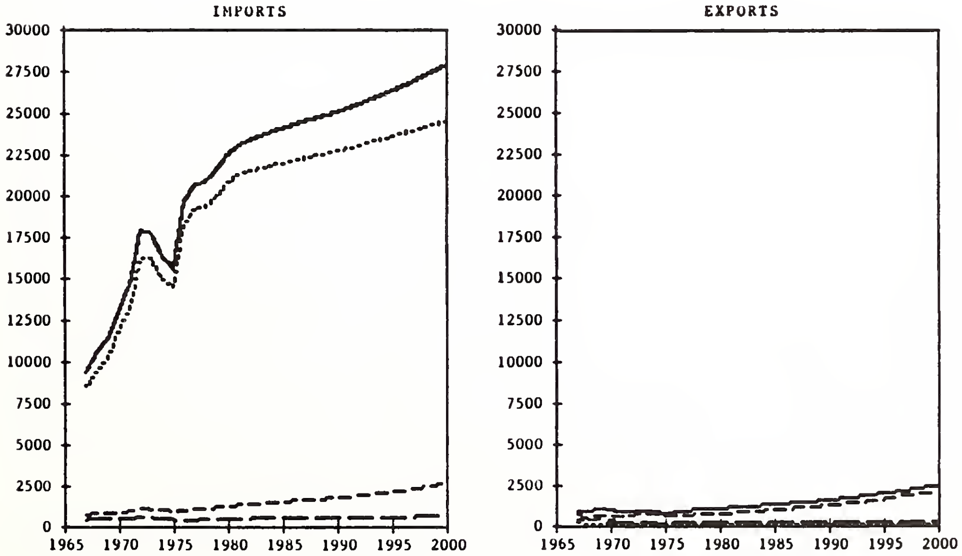
TRADE ROUTE 89
US GRT LKS/ATLANTIC CANADA
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 91
PUERTO RICO/FOREIGN-VIRGIN IS/FOREIGN
FORECAST SUMMARY

(000 Long Tons)

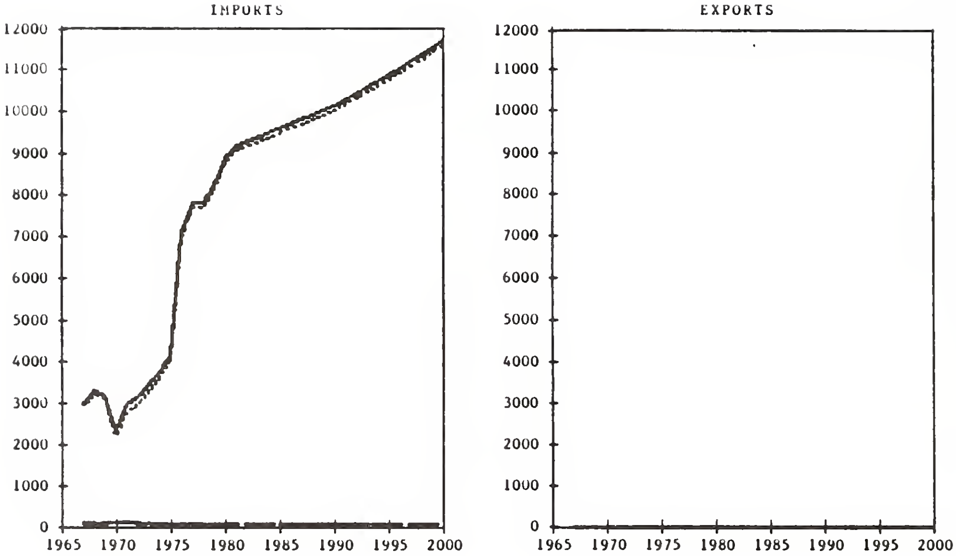


LEGEND

General Cargo	– – – – – –
Dry Bulk	— — —
Liquid Bulk	··············
Total Trade	————

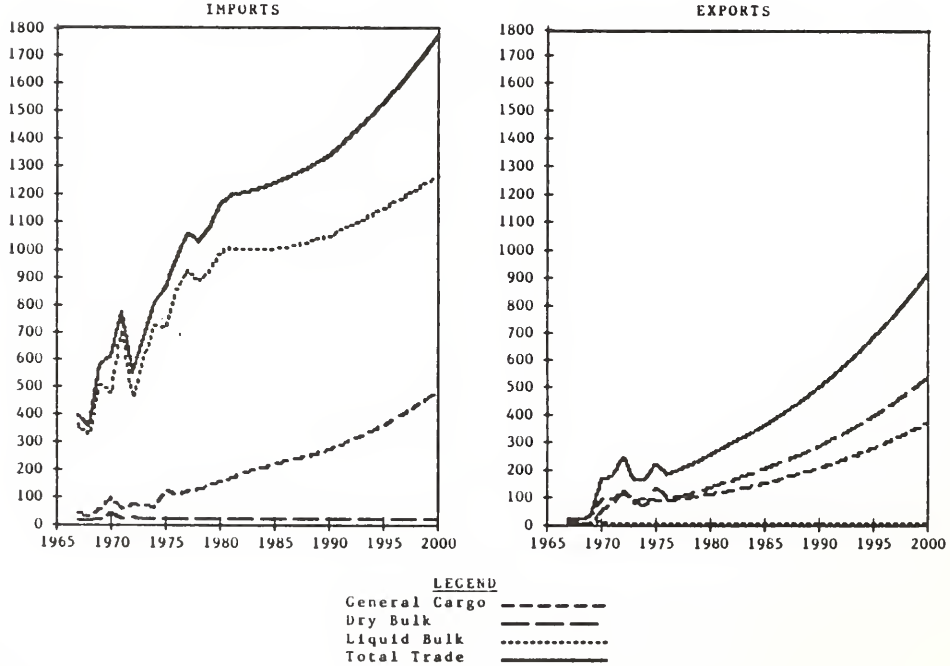
TRADE ROUTE 92
HAWAII/FOREIGN EXCL TR 26,27,29
FORECAST SUMMARY

(000 Long Tons)



TRADE ROUTE 93
ALASKA/FOREIGN EXCL TR 26,29
FORECAST SUMMARY

(000 Long Tons)



Part III

MICRO-MODEL IMPORTS

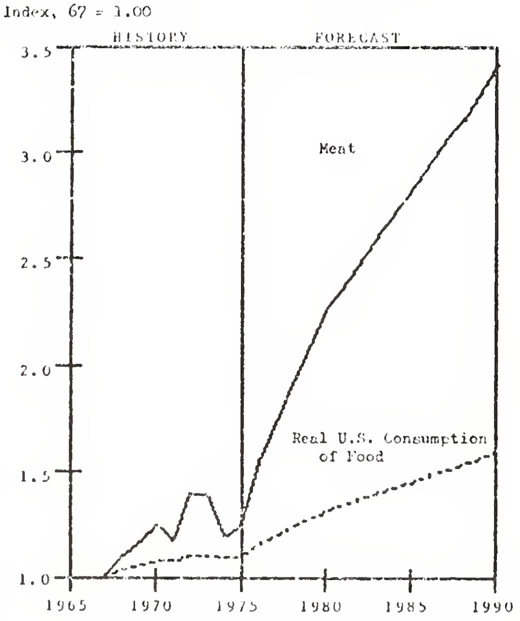
MEAT GROUP

Schedule A Codes: 01 - meat and meat preparations which includes: 011 - fresh, chilled or frozen meat; 012 - dried, salted or smoked port; and 013 - meat in airtight containers and meat preparations, whether or not in airtight containers.

Composition: 72 percent 011; 28 percent 013; and negligible amounts of 012.

Description: These imports constituted 0.6 percent of the total non-oil import tonnage in 1975. Approximately 93 percent of all meat imports in that year were shipped by vessel (Table A). The largest suppliers of the waterborne share in 1975 were Australia (43 percent) and New Zealand (18 percent). Other major suppliers were: Denmark (7 percent), Poland (6 percent), Holland (6 percent) and Argentina (4 percent).

The historical growth of these imports has shown some fluctuations with major declines in 1971, a year marred by severe U.S. dock strikes, and again in 1974 as real domestic food consumption expenditures fell sharply due to the economic recession.



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	614.4	-	90
H#	1968	681.2	10.9	88
I	1969	718.4	5.5	88
S	1970	761.7	6.0	86
T	1971	712.1	-6.5	84
O	1972	855.5	20.1	88
R	1973	851.1	-0.5	90
Y	1974	723.3	-15.0	92
	1975	770.6	6.5	93
F				
O				
R	1980	1376.3	12.3	-
E	1985	1726.0	4.6	-
C	1990	2091.7	3.9	-
A	1995	2578.6	4.3	-
S	2000	3178.8	4.3	-
T				

* BASED ON DOLLAR VALUE.

# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR
WATERBORNE MEAT IMPORTS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Australia	36	41	40	34	43
Denmark	10	10	9	10	7
Holland	6	5	6	6	5
Poland	3	4	4	5	6
New Zealand	15	16	17	18	18
Argentina	7	6	5	7	4
Other	23	18	19	20	17
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The forecast, however, is optimistic based on a marked upturn in food consumption expenditures. It assumes ample foreign supplies and stable prices. Should draughts plague some of our major suppliers, the forecast would require downward adjustment. These imports may also be hindered by quotas under section 22 of the Agricultural Adjustment Act.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = -1564.8 + \underset{(5.7)}{22.4}(\text{Real U.S. Food Consumption Expenditures}) - \underset{(-2.0)}{13.4}(\text{Time}) - \underset{(-2.4)}{68.4}\ (\text{Dummy, 1971})$$

$R^2 = .93$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

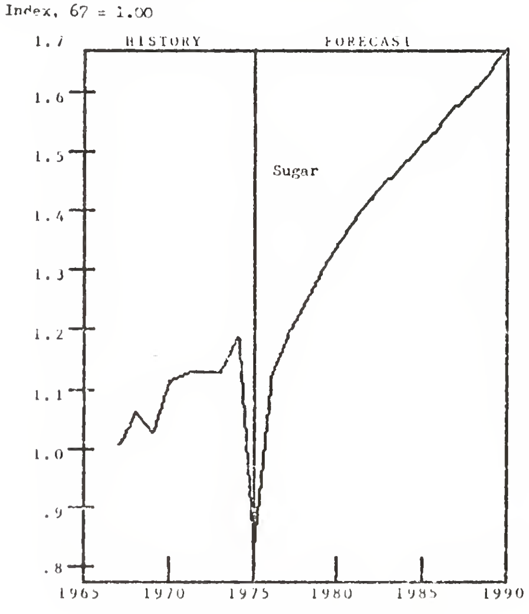
SUGAR GROUP

Schedule A Codes: 06 - sugar, sugar preparations and honey which includes: 061 - sugar, syrups, molasses and honey; 062 - confectionary sugar and flavored or blended sugars, syrups, and molasses.

Composition: 96 percent 061

Description: This group accounted for 3.9 percent of the total non-oil import volume in 1975; down from 4.8 percent in 1974. Roughly 98 percent of all sugar imports are waterborne (Table A). The principal import origins in 1975 were: Dominican Republic (16 percent), Australia (13 percent), Phillipines (8 percent), Brazil (8 percent) and Mexico (6 percent). (See Table B.)

These imports showed positive growth in five of the eight historical years shown. A mild decline in 1969 coincided with some major longshoremen strikes at Atlantic and Gulf ports. A more severe decline occurred in 1975 as domestic stocks were reduced after a buildup in 1974. In 1974, world and U.S. sugar prices almost tripled and reached the highest level in Janaury 1975. But the price gradually declined as the 1975/76 sugar output of 81.3 million tons set a record. The otherwise small increments in sugar



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	5975.4	-	98
	1968	6339.2	6.1	98
	1969	6106.0	-3.7	97
	1970	6656.3	9.0	98
	1971	6719.6	1.0	97
	1972	6750.7	0.5	97
	1973	6736.0	-0.2	98
	1974	7086.8	5.2	99
	1975	4985.3	-29.7	98
FORECAST	1980	8007.9	9.9	-
	1985	9053.0	2.5	-
	1990	10000.5	2.0	-
	1995	11175.7	2.2	-
	2000	12489.1	2.2	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR
WATERBORNE SUGAR IMPORTS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Dominican Republic	12	14	13	13	16
Australia	6	6	5	6	13
Phillipines	21	17	21	18	8
Brazil	11	12	12	15	8
Mexico	13	15	16	14	6
Other	37	36	33	34	49
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, *U.S. General Imports*.

imports reflects slow growth in real U.S. food consumption expenditures as well as the increasing use of domestically produced corn syrups in place of sugar.

The forecast calls for an immediate restoration of import volume in 1976, and a moderate growth rate of 2 percent per year thereafter, over the forecast horizon. The positive impact of rising food consumption expenditures will be offset to some extent by the use of corn syrups. Imports may be prevented from realizing their forecast growth potential by U.S. quota restrictions which are now set at 7 million tons.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = 948.6 + \underset{(1.1)}{64.5}(\text{Real U.S. Food Consumption Expenditures}_{-1}) - \underset{(-0.3)}{52.2}(\text{Time})$$

$$-\underset{(-2.1)}{392.9}(\text{Dummy, 1969}) + \underset{(1.1)}{301.2}(\text{Dummy, 1974}) - \underset{(-2.6)}{1529.5}(\text{Dummy, 1975})$$

$R^2 = .98$

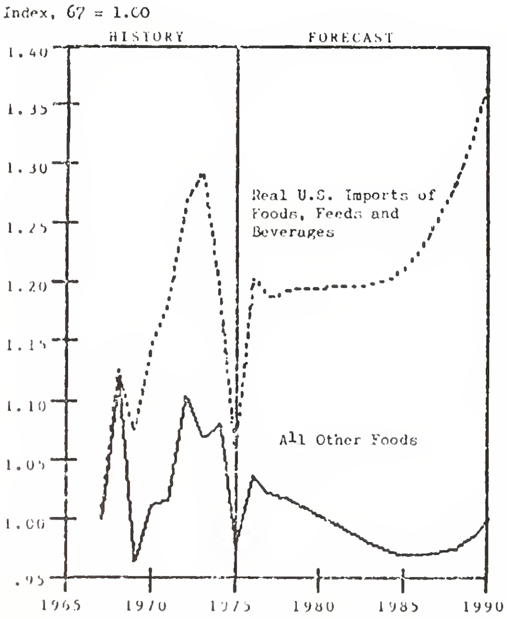
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

ALL OTHER FOODS

Schedule A Codes: 022 - milk and cream; 023 - butter; 024 - cheese; 025 - eggs; 031 - fresh fish; 032 - fish in airtight containers; 041 - wheat; 042 - rice; 043 - barley; 044 - corn; 045 - cereals; 048 - cereal preparations; 051 - fresh fruit and fresh or dried nuts; 052 - dried fruit; 053 - prepared or preserved fruits and nuts; 054 - fresh, chilled or frozen vegetables; 055 - vegetable roots or tubers n.e.s.; 071 - coffee; 072 - cocoa; 073 - chocolate; 074 - tea and mate; 075 - spices; 081 - animal feedstuffs; 091 - margarine, shortening, or other edible fats; 099 - food preparations n.e.s.

Composition: 39 percent 051; 20 percent 071; 10 percent 031; 5 percent 072; 5 percent 053; 5 percent 055; 4 percent 043; 2 percent 081; 2 percent 032; 1 percent 024; 1 percent 054; 1 percent 074; 1 percent 075; 1 percent 099; 1 percent 044; 1 percent 048; and each of the remaining accounted for less than 0.5 percent.

Description: This group amounted to 4.6 percent of total U.S. non-oil waterborne import volume in 1975. Except for a 2 percent rise from 1973 to 1974 the waterborne share of total imports of other foods has fallen steadily from 84 percent in 1967 to 78 percent in 1975 (Table A). Major countries of origin for the waterborne share in 1975 were: Costa Rica (12 percent), Equador (10 percent), Brazil (8 percent), Colombia (7 percent), Honduras (6 percent), Canada (5 percent) and Guatemala (5 percent). (See Table B.)



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	6073.7	-	84
H#	1968	6796.2	11.9	84
I	1969	5831.3	-14.2	81
S	1970	6140.2	5.3	81
T	1971	6163.2	0.4	79
O	1972	6696.1	8.6	79
R	1973	6475.0	-3.3	78
Y	1974	6563.3	1.4	80
	1975	5927.4	-9.7	78
F				
O				
R	1980	6070.6	0.5	-
E	1985	5870.6	-0.7	-
C	1990	6068.8	0.7	-
A	1995	6067.9	-0.0	-
S	2000	6067.0	-0.0	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE
IMPORTS OF ALL OTHER FOODS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Honduras	14	11	12	10	6
Brazil	8	9	7	10	8
Costa Rica	8	9	8	7	12
Ecuador	5	6	7	9	10
Colombia	4	4	4	5	7
Canada	6	7	4	5	5
Guatemala	2	3	4	5	5
Other	53	51	54	49	47
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The historical growth of these imports, principally fruits, nuts, and coffee, has been similar to that of real U.S. imports of foods, feeds, and beverages. The growth of the former series, however, has been weaker than that of the latter due to the declining waterborne share.

The forecast, based on the historical relation between the two series, calls for virtual stagnation of the waterborne volume. Implicit in the forecast is the assumption that the waterborne share will continue to decline. A major uncertainty in the forecast concerns global weather conditions. Long term draughts would undoubtedly result in large positive forecasting errors.

Forecast from 1976 to 1990 based on the following equation:

$$\begin{aligned}\text{Imports} = {} & 6685.44 + \underset{(2.74)}{591.17}\ \text{(Real U.S. Imports of Foods, Feeds, and Beverages)} \\ & - \underset{(-1.34)}{48.35}\text{(Time)} - \underset{(-1.88)}{372.07}\ \text{(Dummy, 1969 and 1971)}\end{aligned}$$

$R^2 = .70$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

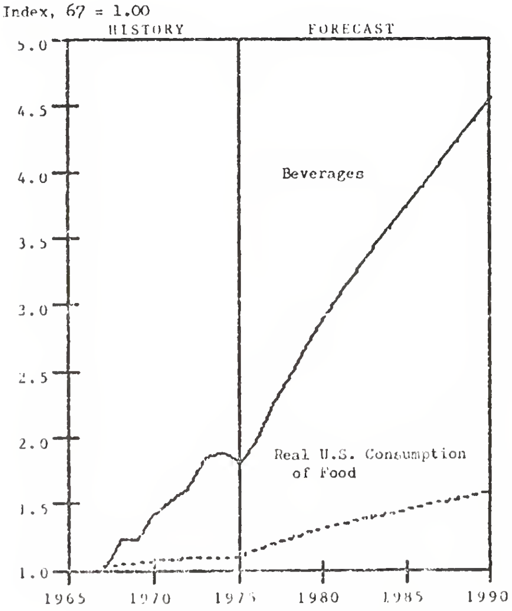
BEVERAGE GROUP

Schedule A Codes: 11 - beverages which includes: 111 - non-alcoholic and 112 - alcoholic.

Composition: 99 percent 112

Description: Beverages occupied only 0.8 percent of the non-oil import volume in 1975. Nearly 80 percent of all waterborne imports came from five countries: England (34 percent), Italy (13 percent), Germany (10 percent), Holland (13 percent) and France (9 percent). In recent years, Englands share has declined while those of Holland and France have shown slight gains (Table B).

Approximately 71 to 76 percent of total beverage imports were waterborne (Table A).



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	538.1	-	73
H#	1968	662.9	23.2	74
I	1969	651.3	-1.8	71
S	1970	764.2	17.3	74
T	1971	819.1	7.2	72
O	1972	869.4	6.1	71
R	1973	990.7	14.0	73
Y	1974	1016.8	2.6	76
	1975	962.2	-5.4	72
F				
O				
R	1980	1545.2	9.9	-
E	1985	2005.8	5.4	-
C	1990	2442.0	4.0	-
A	1995	3069.9	4.7	-
S	2000	3859.3	4.7	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR
WATERBORNE BEVERAGE IMPORTS
Percent Of Total Weight

	1971	1972	1973	1974	1975
England	43	37	35	38	34
Germany	11	11	11	10	10
Italy	10	11	11	11	13
France	12	14	13	9	9
Holland	6	7	8	10	13
Other	18	20	22	22	21
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The importation of alcoholic beverages has nearly doubled during the last nine years; it increased from 538 MLT, million long tons, in 1967 to 962 MLT in 1975. Except in 1969 when there was a longshoreman strike and during the 1975 recession period, the imports of alcoholic beverages have shown continuous growth.

Alcoholic beverage consumption is closely related to the U.S. consumption of food, and the latter is expected to grow steadily in the future in the absence of an economic recession. The forecast shows an average annual growth rate of 9.9 percent in the 1976-80 period in order to regain a sharp drop in imports in 1975, and steady growth at an average annual rate of 4 to 5 percent thereafter. These are long-term trend forecasts and there would be annual variations due to cyclical factors which cannot be foreseen at this time.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = -3417.31 + \underset{(3.20)}{16.05}\,(\text{Real U.S. Food Consumption}) + \underset{(2.54)}{27.06}(\text{Time}) \underset{(-2.14)}{-63.36}\,(\text{Dummy, 1969, 1971});\ R^2 = .98$$

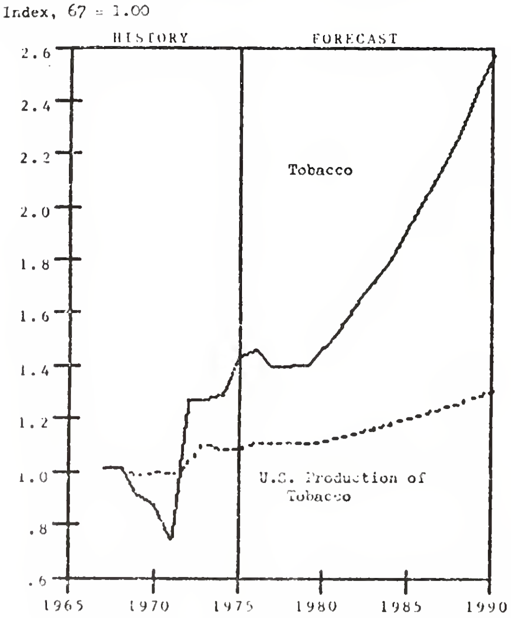
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

TOBACCO GROUP

Schedule A Codes: 12 - tobacco and tobacco manufactures which includes: 121 - unmanufactured tobacco and 122 - tobacco manufactures.

Composition: 95 percent 121.

Description: This group accounted for only .1 percent of U.S. non-oil waterborne import volume in 1975. The waterborne share of total tobacco imports has ranged from 97 percent in 1967 to 87 percent in 1975 (Table A). The major countries of origin for these imports are Turkey (20 percent), Italy (12 percent), Brazil (10 percent), Korea (10 percent), Phillipines (6 percent), and Greece (5 percent). Over the last five years Turkey, Greece and the Phillipines have lost some of their market share while Korea and Italy have gained (Table B).



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	121.2	-	97
H#	1968	121.9	0.6	96
I	1969	108.9	-10.6	95
S	1970	104.4	-4.1	93
T	1971	88.5	-15.3	89
O	1972	153.7	73.7	90
R	1973	154.4	0.5	88
Y	1974	156.2	1.1	87
	1975	173.6	11.2	93
F				
O				
R	1980	177.7	0.5	-
E	1985	233.1	5.6	-
C	1990	311.4	6.0	-
A	1995	412.3	5.8	-
S	2000	545.8	5.8	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR
WATERBORNE TOBACCO IMPORTS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Turkey	37	43	37	30	20
Greece	10	10	4	5	5
Brazil	6	8	8	8	10
Italy	-	1	3	8	12
Korea	1	1	3	7	10
Phillipines	12	9	8	6	6
Other	34	28	37	36	37
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

Except for the period 1969 to 1971 imports have shown positive growth. The declines over the three year period 1969-71 coincided with severe dock strikes as well as general stagnation in the U.S. tobacco industry.

The forecast calls for very slow growth (.5 percent per year) over the next five years (1976-80), but a sharp upturn may be experienced after 1980. This projection is based on the historical relationship between imports and U.S. tobacco production.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Log}_{10}\text{Imports} = 2.08 + \underset{(9.42)}{3.60}\text{Log}_{10}(\text{U.S. Industrial Production--Tobacco}) - \underset{(-1.78)}{.089}(\text{Dummy, 1971})$$

$R^2 = .86$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

HIDES AND SKINS

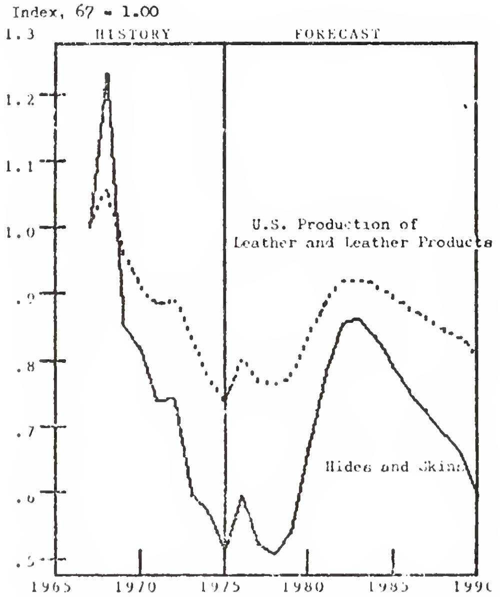
Schedule A Codes: 21 - Hides, skins and furskins which includes: 211 - hides and skins excluding furskins and 212 - furskins.

Composition: 89 percent 211.

Description: Hides and skins represent only .02 percent of the U.S. non-oil waterborne import tonnage. The waterborne share of total imports of hides and skins has ranged from 45 percent in 1969 to 54 percent in 1972 (Table A).

The historical growth pattern of these imports parallels closely, but with much higher amplitudes, that of U.S. production of leather and leather products.

The major source countries are Iran (44 percent), New Zealand (22 percent), and France (10 percent). From 1967 to 1975 Iran doubled her share while New Zealand lost 16 percent (Table B).



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	47.2	-	46
HISTORY#	1968	58.0	22.9	48
	1969	40.2	-30.7	45
	1970	38.4	-4.5	48
	1971	34.7	-9.7	52
	1972	34.9	0.8	54
	1973	27.9	-20.0	46
	1974	26.8	-4.1	49
	1975	24.0	-10.6	46
FORECAST	1980	31.2	5.5	-
	1985	37.0	3.5	-
	1990	27.9	-5.5	-
	1995	26.4	-1.1	-
	2000	25.0	-1.1	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305. FT 150. "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF HIDES AND SKINS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Iran	22	28	33	38	44
New Zealand	38	28	23	23	22
France	11	15	13	13	10
Other	29	29	31	26	24
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The forecast is based on U.S. production of leather and leather products. An up and down outlook for this industry will result in the same for imports. This cyclical pattern reflects the liquidation of herds associated with the draughts of recent years. The breeding cycle takes approximately seven years. The upswing thus reflects an abundant supply as well as growth in aggregate demand.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = 54.85 + \underset{(9.42)}{103.66}(\text{U.S. Industrial Production--Leather and Products}) - \underset{(-1.38)}{4.66}(\text{Dummy, 1969})$$

$R^2 = .94$

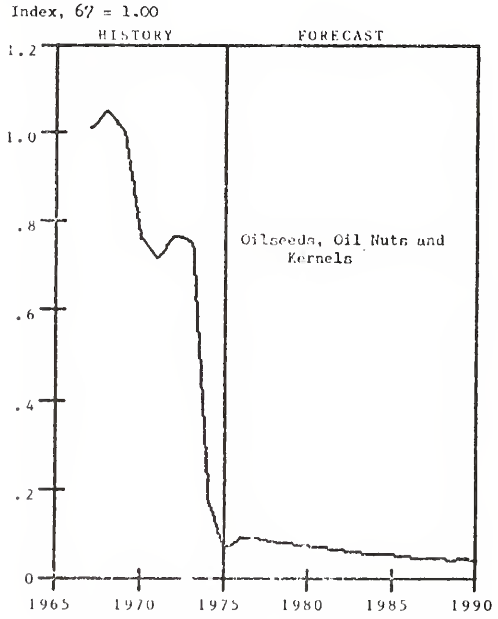
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

OILSEEDS, OIL NUTS AND KERNELS

Schedule A Code: 221

Description: This group is only .01 percent of the non-oil waterborne import volume. A drastic fall in both the waterborne share of this trade and the waterborne tonnage has occurred over the last three years (1973-75) mainly the result of the cessation of the copra trade with the Far East (Table A).

Some equally drastic changes have occurred among the major suppliers. The Phillipines, which supplied 93 percent of these imports in 1972, provided virtually nothing in 1975 while Guatemala, Nicaragua and Ethiopia picked up 69 percent with the remainder shared by many insignificant suppliers (Table B).



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	269.8	-	89
H#	1968	304.3	5.0	92
I	1969	287.7	-5.4	90
S	1970	216.9	-24.6	88
T	1971	205.9	-5.1	83
O	1972	222.3	8.0	76
R	1973	214.7	-3.4	83
Y	1974	48.5	-77.4	53
	1975	16.7	-65.7	39
F				
O				
R	1980	19.1	2.7	-
E	1985	12.6	-8.0	-
C	1990	8.3	-8.0	-
A	1995	5.5	-8.0	-
S	2000	3.6	-8.0	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305. FT 150. "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF OILSEEDS, OIL NUTS AND KERNELS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Phillipines	91	93	91	54	-
Guatemala	3	3	4	16	27
Nicaragua	2	1	2	6	18
Ethiopia	1	1	-	12	24
Other	3	2	3	12	31
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

Such drastic changes in the past make forecasting tenuous at best. The projection for this group is made with a simple time trend and a dummy variable from 1974 to 1990 to account for the cessation of the copra trade which we assume permanent.

Forecast from 1976 to 1990 based on the following equation:

$$\log_{10}\text{Imports} = 4.93 - \underset{(-1.53)}{.04(\text{Time})} - \underset{(-5.22)}{.77\ (\text{Dummy, 1974-1990})}$$

$R^2 = .93$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

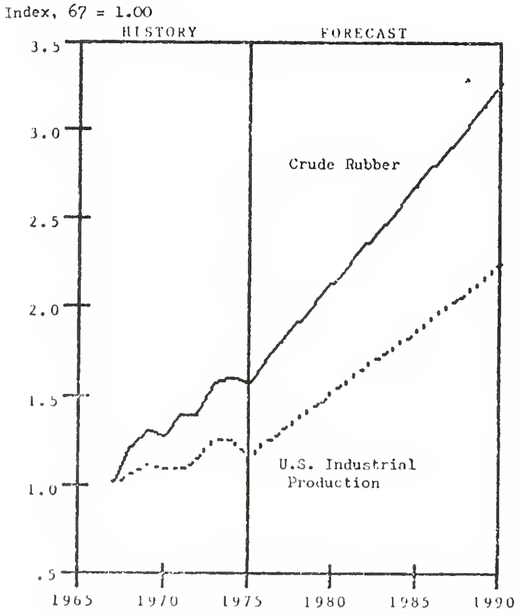
CRUDE RUBBER

Schedule A Code: 231

Description: Crude rubber accounted for 0.6 percent of the non-oil waterborne import volume in 1975. 85 to 92 percent of all rubber imports from 1967 to 1975 have been waterborne (Table A). The major source countries are Indonesia (45 percent), Malaysia (28 percent), and Liberia (12 percent). Malaysia has lost some of its share while Indonesia has gained (Table B).

The growth pattern for these imports follows closely that of U.S. industrial production. The only declines registered by these imports were in the recession years, 1970 and 1975.

Sustained growth is forecast for this group in an environment of steady growth of U.S. industrial production.



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	501.8	-	90
	1968	608.8	21.3	90
	1969	652.8	7.2	90
	1970	630.2	-3.5	90
	1971	700.9	11.2	85
	1972	700.8	-0.0	85
	1973	788.2	12.5	91
	1974	801.9	1.7	92
	1975	773.9	-3.5	90
FORECAST	1980	1072.7	6.7	-
	1985	1344.6	4.6	-
	1990	1632.7	4.0	-
	1995	2014.3	4.3	-
	2000	2485.1	4.3	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR
WATERBORNE RUBBER IMPORTS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Indonesia	21	32	36	42	45
Malaysia	41	33	32	29	28
Liberia	12	12	11	10	12
Singapore	7	8	5	6	5
Thailand	4	4	3	2	3
Other	14	11	13	11	7
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = -1432.84 + \underset{(2.58)}{461.94}(\text{U.S. Industrial Production}) + \underset{(4.14)}{22.53}(\text{Time})$$

$R^2 = .94$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

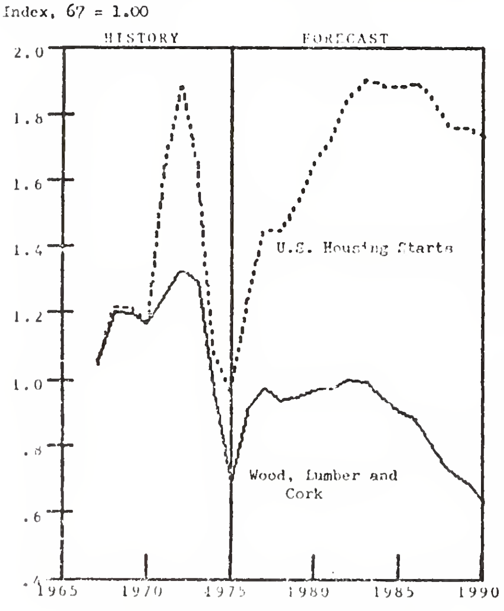
WOOD GROUP

Schedule A Codes: 24 - wood, lumber and cork which includes: 241 - fuel wood, wood charcoal and wood waste; 242 - wood in the rough, split hewn or roughly sided or squared; 243 - wood shaped or simply worked and 242 - cork.

Composition: 80 percent 243; 13 percent 242; 7 percent 241 and neglible amounts of 244.

Description: These imports accounted for 1.5 percent of the non-oil waterborne import volume in 1975; down from 3 percent in 1973. The waterborne share of total wood imports, in terms of value, has dropped steadily from 36 percent in 1967 to 28 percent in 1975 (Table A). Canada supplies 78 percent of the imports followed by the Bahamas (6 percent), Brazil (4 percent), and Malaysia (2 percent). (See Table B.)

The volatility of the import time series, particularly the 1973 boom and 1974-75 bust, matches closely, but with less severity, that of U.S. housing starts. In 1974, new



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	2991.4	-	36
HISTORY#	1968	3464.3	15.8	35
	1969	3420.0	-1.3	34
	1970	3338.1	-2.4	32
	1971	3579.4	7.2	29
	1972	3831.8	7.1	29
	1973	3701.6	-3.4	28
	1974	2694.3	-27.2	31
	1975	1913.9	-29.0	28
FORECAST	1980	2748.3	7.5	-
	1985	2543.4	-1.5	-
	1990	1718.9	-7.5	-
	1995	1359.4	-4.6	-
	2000	1075.1	-4.6	-

* BASED ON DOLLAR VALUE.

# SOURCE: BUREAU OF THE CENSUS. SA 305. FT 150. "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE
IMPORTS OF WOOD, LUMBER AND CORK
Percent Of Total Weight

	1971	1972	1973	1974	1975
Canada	76	73	71	67	78
Bahamas	12	12	9	0	6
Brazil	3	4	6	5	4
Malaysia	2	3	2	5	2
Other	7	8	12	15	10
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

housing construction--the market for over a third of the soft wood lumber and plywood, and for substantial amounts of other timber products--dropped rapidly. For the year, total starts were 1.35 million units, about 34 percent below 1973 and the smallest yearly total since 1967. Although there was some monthly fluctuation, the steepest declines came late in the year, and by the last quarter, the seasonally adjusted annual rate had dropped to less than a million units. The decline in housing activity has been partially the result of record high interest rates coupled with severe shortages of funds for mortgage and construction loans. In early 1975, activity in the major timber products markets continued to decline. By the end of 1975, however, the slump in housing industry bottomed out and housing demand began to show some improvement. As the economy recovered in 1976, and activities for new construction improved, the imports of wood products also regained.

The forecast is based on the growth of U.S. housing starts which is in turn to a large extent determined by demographic factors. The post World War II baby boom has now grown into the 1975-83 housing boom. U.S. population in the age bracket 24 to 29 will reach a peak during this period. Since this group is the major market for new houses, housing starts and wood imports are also expected to peak during this period barring a credit crunch or other exogenous shock. (U.S. housing starts, not including mobile homes, is forecast to increase from 1.543 million units in 1976 to 2.376 million units in 1983 and gradually decline to a level of 2.149 million units in 1990.)

Forecast from 1976 to 1990 based on the following equation:

Imports = 9311.07 + 1274.04(U.S. Housing Starts) - 114.79(Time) - 175.44
(5.37) (-3.45) (-0.60)
(Dummy, 1971)

$R^2 = .89$

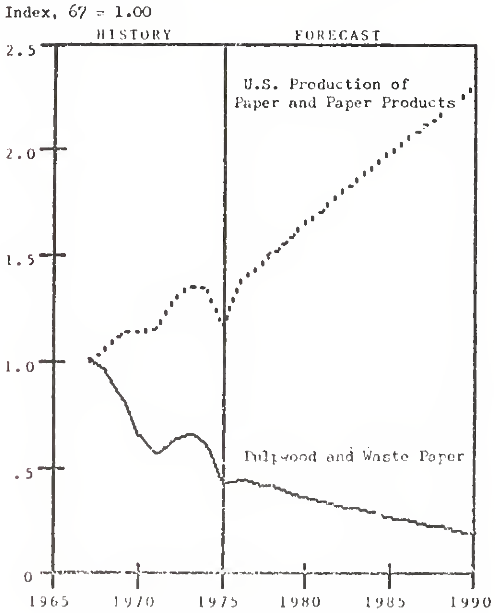
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

PULPWOOD AND WASTE PAPER

Schedule A Code: 251

Description: Pulpwood and waste paper were only 0.2 percent of the non-oil waterborne import volume in 1975. Canada provides the major share, 67 percent, of these imports, followed by South Africa (16 percent), Sweden (9 percent) and Finland (2 percent). (See Table B.) Because, each year, larger percentages of pulpwood and waste paper are brought to the U.S. via inland routes from Canada, the waterborne share of total imports of pulpwood and waste paper has declined steadily from 18 percent in 1967 to 9 percent in 1975. (See Table A.)

The growth pattern for these imports appears similar to that of U.S. paper production. The steady loss in waterborne share, however, has reduced import tonnage carried by vessels.



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	697.8	-	18
H#	1968	659.6	-5.5	14
I	1969	571.4	-13.4	13
S	1970	445.4	-22.1	12
T	1971	386.5	-13.2	10
O	1972	438.2	13.4	10
R	1973	458.7	4.7	12
Y	1974	413.1	-9.9	9
	1975	285.9	-30.8	9
F				
O				
R	1980	245.4	-3.0	-
E	1985	176.8	-6.3	-
C	1990	126.1	-6.5	-
A	1995	90.4	-6.4	-
S	2000	64.8	-6.4	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF PULPWOOD AND WASTE PAPER
Percent Of Total Weight

	1971	1972	1973	1974	1975
Canada	70	75	66	65	67
South Africa	14	13	13	18	16
Sweeden	4	6	13	10	9
Finland	9	5	5	1	2
Other	3	1	3	6	6
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The loss in waterborne share is expected to continue over the forecast horizon. Consequently, waterborne import volume is projected to decline despite the projected growth in U.S. production of paper and paper products.

Forecast from 1976 to 1990 based on the following equation:

$$\mathrm{Log}_{10}\mathrm{Imports} = 19.99 + \underset{(2.32)}{1.32}\mathrm{Log}_{10}(\text{U.S. Industrial Production--Paper and Products})$$

$$- \underset{(-6.22)}{9.40}\mathrm{Log}_{10}(\text{Time}) - \underset{(-1.51)}{.05}(\text{Dummy, 1969, 1971})$$

$R^2 = .92$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

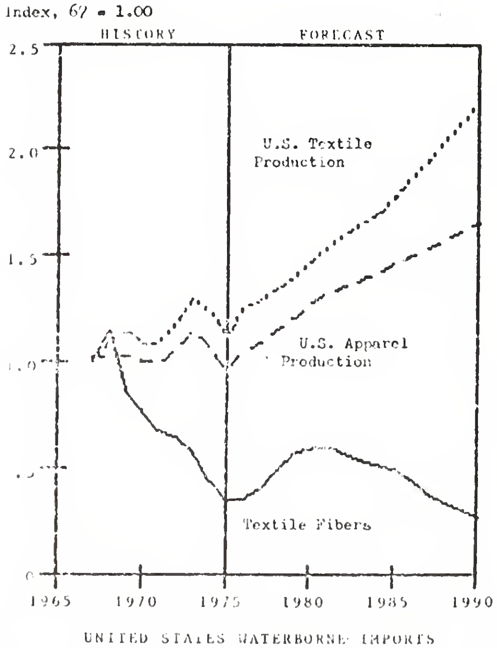
TEXTILE FIBERS

Schedule A Codes: 26 - textile fibers and waste which includes: 261 - raw silk; 262 - wool and other animal hair; 263 - cotton; 264 - jute; 265 - vegetable fibers and their waste excluding cotton; 266 - manmade fibers and their waste; 267 - waste from textile fabrics.

Composition: 29 percent 266; 23 percent 262; 21 percent 265; 14 percent 264; 7 percent 267; 6 percent 263 and negligible amounts of 261.

Description: These imports represented only 0.1 percent of the non-oil waterborne import volume in 1975. The waterborne share of total textile fiber imports has fallen from 94 percent in 1973 to 88 percent in 1975 (Table A). No country or group of countries is a dominant supplier of this import. The largest sources are Japan and Australia with only 18 percent of the market between them (Table B).

In addition to changing modal shares, U.S. textile and apparel production appear to have influenced this trade. U.S. apparel production, the major domestic user of textile



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	470.0	-	95
	1968	533.7	13.6	99
	1969	398.6	-25.3	92
	1970	356.2	-10.6	96
	1971	307.9	-13.6	93
	1972	295.7	-4.0	92
	1973	259.8	-12.1	94
	1974	195.4	-24.8	89
	1975	151.9	-22.3	88
FORECAST	1980	272.0	12.4	-
	1985	222.0	-4.0	-
	1990	121.2	-11.4	-
	1995	80.9	-7.8	-
	2000	54.0	-7.8	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF TEXTILE FIBERS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Japan	8	9	9	11	9
Australia	5	5	3	2	9
England	12	10	9	8	7
Austria	2	2	3	3	7
Germany	6	6	7	6	5
New Zealand	11	9	7	5	5
Thailand	2	2	5	7	9
Phillipines	5	7	7	16	7
Ecuador	-	1	1	3	6
Other	49	49	49	39	36
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

fibers, had a positive influence while textile production, an import substitute, had a negative impact. (See forecast equation.) The net result has been a considerable decline in waterborne imports of textile fibers.

The forecast indicates that, from 1975 to 1980, apparel production is expected to grow faster than textile production. Imports will benefit from this. After 1980 the reverse is expected (Table A).

Forecast from 1976 to 1990 based on the following equation:

$$\text{Log}_{10}\text{Imports} = 2.80 - \underset{(-4.04)}{7.59}\,\text{Log}_{10}(\text{U.S. Industrial Production--Textiles}) + \underset{(3.33)}{8.74}\,\text{Log}_{10}(\text{U.S. Industrial Production--Apparel})$$

$R^2 = .73$

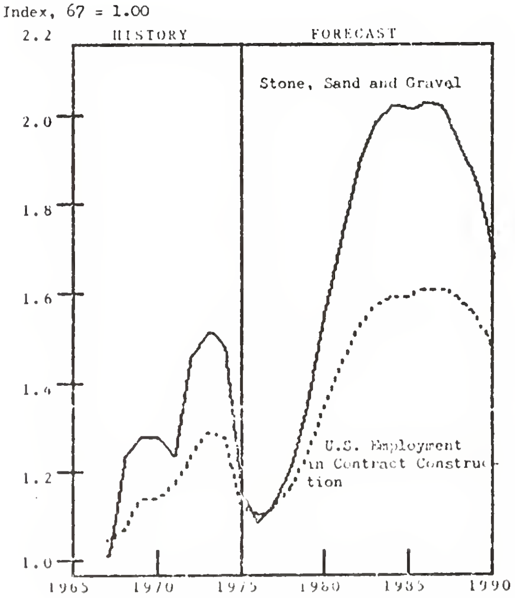
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

STONE, SAND AND GRAVEL

Schedule A Code: 273

Description: Stone, sand and gravel represented 6.0 percent of the non-oil waterborne import volume in 1975. The major countries of origin for these imports are Canada (82 percent) and Mexico (12 percent). (See Table B.) The waterborne share of total stone, sand and gravel imports has declined in five of the eight years shown; a 7 percent loss from 1967 to 1975 (Table A).

These imports are closely related to U.S. employment in contract construction. The 1971 decline in imports, which was more pronounced than the slowdown in construction, was partly the result of U.S. dock strikes. The fall in 1974-75 was due to economic recession.



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	6776.6	-	92
H#	1968	8303.6	22.5	93
I	1969	8629.5	3.9	90
S	1970	8650.0	0.2	92
T	1971	8282.7	-4.2	90
O	1972	9827.3	18.6	88
R	1973	10225.3	4.0	87
Y	1974	9966.9	-2.5	88
	1975	7721.7	-22.5	85
F				
O				
R	1980	10523.3	6.4	-
E	1985	13603.1	5.3	-
C	1990	11314.8	-3.6	-
A	1995	11732.5	0.7	-
S	2000	12165.7	0.7	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF STONE, SAND AND GRAVEL
Percent Of Total Weight

	1971	1972	1973	1974	1975
Canada	84	83	84	84	82
Mexico	10	11	11	11	12
Other	6	6	5	5	6
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The forecast is based on the relation between imports and construction employment. The outlook for these variables in turn reflects the changing composition of U.S. population. The demand for new construction (principally housing) and thus imports of stone, sand and gravel are expected to peak in five to ten years as the baby boom generation grows through the stages of household formation.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = -426.22 + \underset{(6.33)}{4440.51}(\text{U.S. Employment in Contract Construction}) - \underset{(-1.35)}{96.01}(\text{Time}) - \underset{(-1.46)}{616.85}(\text{Dummy, 1971})$$

$R^2 = .92$

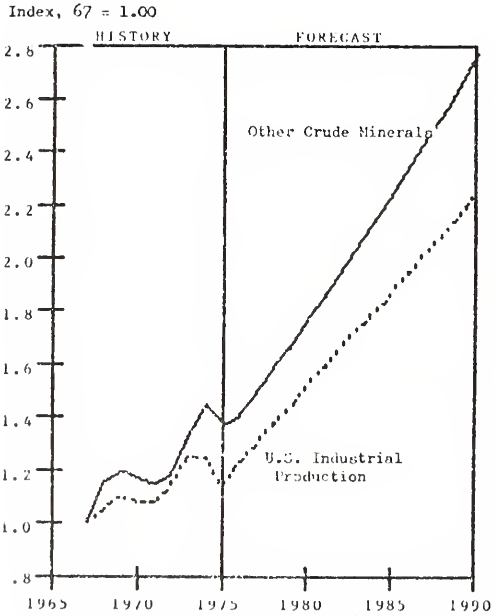
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

OTHER CRUDE MINERALS

Schedule A Codes: Includes: 271 - crude fertilizers; 274 - sulfur and unroasted iron pyrites; 275 - natural abrasives; and 276 - crude minerals, n.e.s.

Composition: 80 percent 276; 15 percent 274; 3 percent 271; and 2 percent 275.

Description: Other crude minerals accounted for 5.2 percent of the non-oil, waterborne import volume in 1975. The waterborne share of total imports of other minerals ranged from 34 percent in 1972 to 46 percent in 1975 (Table A). Major countries of origin for these imports are the Bahamas (37 percent), Mexico (29 percent) and Canada (11 percent). Canada has lost a large share of the market to the Bahamas (Table B).



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	4933.9	-	40
H#	1968	5689.1	15.3	42
I	1969	5877.3	3.3	41
S	1970	5685.4	-3.3	39
T	1971	5637.7	-0.8	38
O	1972	5822.0	3.3	34
R	1973	6606.1	13.5	35
Y	1974	7151.2	8.3	38
	1975	6700.7	-6.3	46
F				
O				
R	1980	8687.6	5.3	-
E	1985	11001.3	4.8	-
C	1990	13672.3	4.4	-
A	1995	17151.9	4.6	-
S	2000	21517.1	4.6	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF OTHER CRUDE MINERALS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Bahamas	15	26	36	32	37
Mexico	27	27	20	27	29
Canada	32	15	15	14	11
Other	26	32	29	27	23
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The forecast is based on the relation between imports of crude materials and U.S. industrial production. Steady growth is expected for both over the forecast horizon.

Forecast from 1976 to 1990 based on the following equation:

$$\mathrm{Log}_{10}\mathrm{Imports} = 1.01 + \underset{(1.77)}{.72}\mathrm{Log}_{10}(\text{U.S. Industrial Production}) + \underset{(1.94)}{1.47}\mathrm{Log}_{10}(\text{Time}) \underset{(-.57)}{-.01}(\text{Dummy, } 1971)$$

$R^2 = .88$

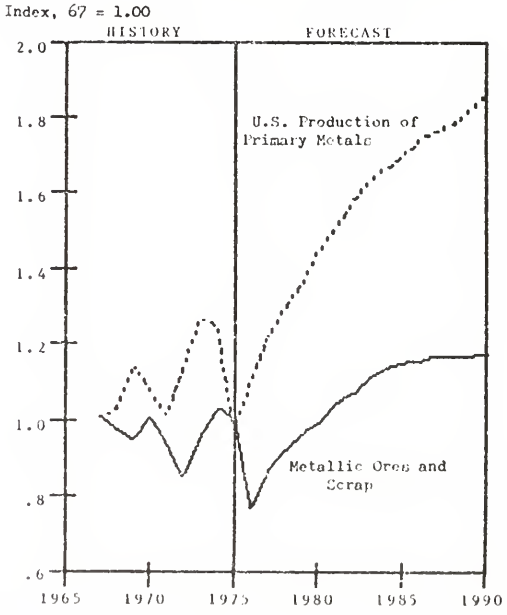
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

METALLIC ORES AND SCRAP

Schedule A Codes: metallic ores and scrap which includes: 281 - iron ores and concentrates; 282 - iron and steel scrap; 283 - ores and concentrates of nonferrous base metals; 284 - nonferrous metal scrap; 285 - silver and platinum; and 286 - thorium ores and concentrates.

Composition: 73 percent 281; 26 percent 283; 1 percent 284; and negligible amounts of each of the remaining.

Description: This is the second largest import group. In 1975 they accounted for 47 percent of the non-oil waterborne import volume. Nearly 75 percent of these ores were imported from four countries: Canada (28 percent), Venezuela (22 percent), Brazil (13 percent) and Jamaica (12 percent). (See Table B.) Brazil increased its share from only 4 percent in 1971, while Canada lost 6 percent over the same period. The waterborne share of imports, in terms of dollar value, fluctuated between 83 percent in 1967 and 74 percent in 1974, but with no discernible trend (Table A).



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	61018.7	-	83
HISTORY#	1968	58673.3	-3.8	80
	1969	57305.8	-2.3	78
	1970	61369.3	7.1	77
	1971	56945.9	-7.2	78
	1972	51495.6	-9.6	78
	1973	58240.3	13.1	75
	1974	62743.4	7.7	74
	1975	60212.8	-4.0	81
FORECAST	1980	60704.5	0.2	-
	1985	69856.3	2.8	-
	1990	71614.9	0.5	-
	1995	77784.7	1.7	-
	2000	84486.2	1.7	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF METALLIC ORES AND SCRAP
Percent Of Total Weight

	1971	1972	1973	1974	1975
Canada	34	33	35	28	28
Venezuela	23	21	22	24	22
Jamaica	16	17	13	12	12
Brazil	4	3	7	11	13
Other	23	26	23	25	25
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The imports of metallic ores and scrap have shown a slight decline during the nine-year history . . . paralleling fluctuations in U.S. production of primary metals, but with a one-year lag. In terms of tonnage, the U.S. imported 61 million long tons in 1967 and shipped nearly the same amount, 60 million tons in 1975. A possible explanation for this sluggishness is the preprocessing of ores before shipment which eliminates impurities thereby reducing shipment weight.

The forecast shows a sharp decline in metallic ore import volume in 1976. But it will rebound to the 1975 level by 1980, and will even register slight gains for the remaining forecast period. The continued sluggishness of the import tonnage may be indicative of the increasing substitution of preprocessed ores for crude ores.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = 84334.85 + \underset{(8.11)}{47751.67}(\text{U.S. Industrial Production--Primary Metals-1}) - \underset{(-5.56)}{1105.81}\,(\text{Time})$$

$R^2 = .92$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

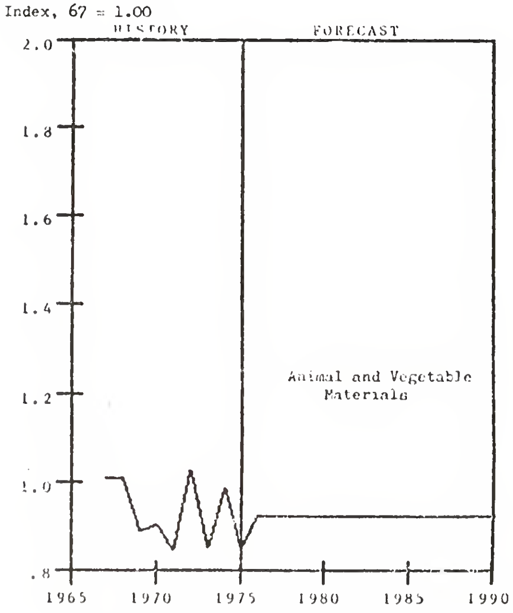
ANIMAL AND VEGETABLE MATERIALS

Schedule A Codes: 29 - Animal and vegetable materials which includes: 291 - animal materials and 292 - vegetable materials.

Composition: 78 percent 292

Description: This group accounted for only 0.2 percent of the non-oil waterborne import volume in 1975. Major countries of origin are India (12 percent), Mexico (11 percent), Argentina (7 percent) and Holland (6 percent). No permanent shifts in market shares have occurred (Table B). The waterborne share of total imports of animal and vegetable materials has ranged from 71 percent in 1967 to 61 percent in 1975 (Table A).

The import tonnage seems to have fluctuated year to year in response to changing percentage of waterborne share. The nine-year import tonnage, however, shows fluctuation within a narrow band of 2.42 to 2.96 million long tons.



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	289.4	-	71
H#	1968	288.8	-0.2	68
I	1969	255.0	-11.7	67
S	1970	260.2	2.0	67
T	1971	242.3	-6.9	63
O	1972	296.3	22.3	67
R	1973	244.3	-17.6	64
Y	1974	284.3	16.4	65
	1975	244.4	-14.0	61
F				
O				
R	1980	267.2	1.8	-
E	1985	267.2	0.	-
C	1990	267.2	0.	-
A	1995	267.2	0.	-
S	2000	267.2	0.	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305. FT 150. "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF ANIMAL AND VEGETABLE MATERIALS
Percent of Total Weight

	1971	1972	1973	1974	1975
India	15	13	9	14	12
Mexico	11	9	13	13	11
Argentina	10	11	5	6	7
Brazil	7	7	6	5	7
Holland	6	6	6	6	6
Other	51	54	61	56	57
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

For this group, no regression analysis was made and it was assumed that the future import tonnage would fluctuate around the level of 267,200 long tons, the nine-year historical average.

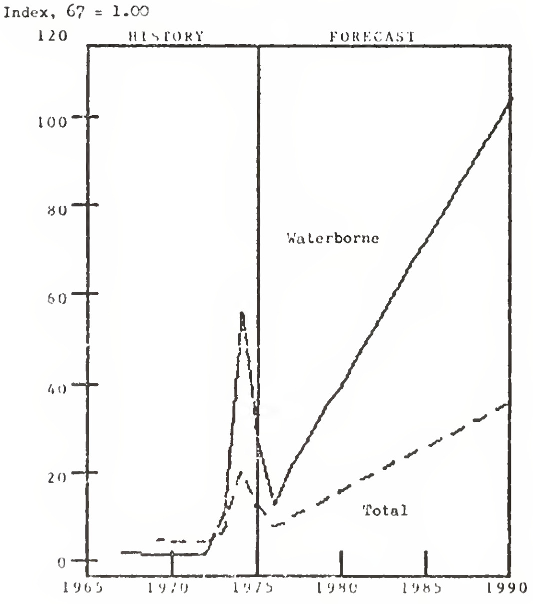
COAL GROUP

Schedule A Code: 321 - coal, coke and briquets

Description: Coal was 1.8 percent of the non-oil waterborne import volume in 1975. The waterborne share of total coal imports in 1974 and then fell off to 82 percent in 1975 (Table A). This was largely due to changes among the major countries of origin for these imports. Germany's share has grown from 26 percent in 1971 to 58 percent in 1975 while Canada's share over the same period declined from 23 to 6 percent (Table B).

In addition to the sharp growth in waterborne share, the level of U.S. industrial production and the energy upheavals in recent years appear to explain the historical growth pattern of these imports.

The changes in mode of transportation coupled with the energy crisis make forecasting this import very difficult.



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	87.4	-	29
	1968	62.0	-29.1	22
	1969	21.7	-64.9	9
	1970	18.7	-13.9	12
	1971	45.6	143.8	18
	1972	62.4	36.6	29
	1973	896.2	1337.2	83
	1974	4866.8	443.0	96
	1975	2290.8	-52.9	93
FORECAST	1980	3453.6	8.6	-
	1985	6277.4	12.7	-
	1990	9126.2	7.8	-
	1995	14835.6	10.2	-
	2000	24116.6	10.2	-

* BASED ON VOLUME.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR
WATERBORNE COAL IMPORTS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Germany	26	12	78	60	58
Canada	23	60	15	10	6
South Africa	22	21	-	4	17
Other	29	7	7	26	81
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

If the forecasting model were built with the waterborne series, the forecast would be skewed upward. The model was therefore built with the total (all modes) series which was available from the Bureau of Mines Minerals Yearbook. The 1975 waterborne share was then assumed to prevail over the forecast period. Even using the total series the forecast was skewed upward by the energy disruptions which contributed to record coal import levels in 1974. To eliminate this impact a dummy variable was used for that year. The resulting forecast is based on the relationship of coal imports to U.S. industrial production.

Forecast from 1976 to 1990 based on the following equations:
Imports (all modes of transportation = -8458.80 + 8476.52(U.S. Industrial
(4.58)
Production -1) -702.87(Dummy, 1969) + 2924.75(Dummy, 1974) $R^2 = .96$
(-1.02) (5.47)
Imports (waterborne) = .93(imports(all modes)), where .93 is the 1975 waterborne share of total coal import tonnage.
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

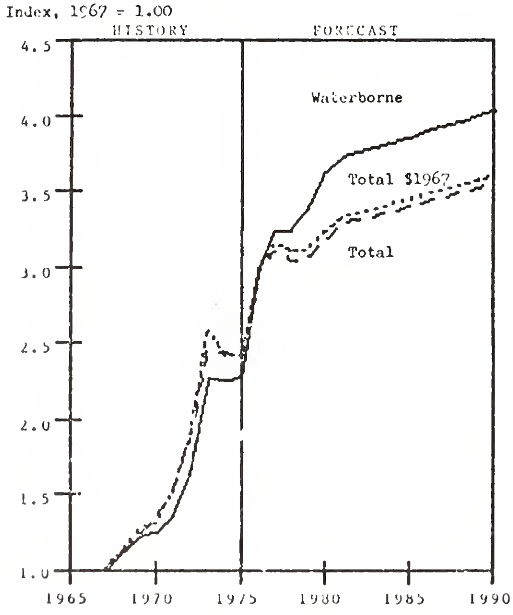
PETROLEUM GROUP

Schedule A Codes: 33 - petroleum and petroleum products which includes: 331 - petroleum--crude and partly refined for further refining; and 332 - petroleum products.

Composition: 73 percent 331.

Description: Petroleum represents 66 percent of the total U.S. waterborne import volume and 98 percent of our total waterborne fuel imports. Coal and gas account for the remainder. The waterborne share of total petroleum imports ranged from 77 percent in 1972 to 88 percent in 1967-68. If Canada carries out its planned phase out of oil exports to the U.S., virtually 100 percent of our oil imports will be waterborne by 1980 (Table A).

These imports have more than doubled from 1967 to 1975. Growth decelerated in 1974 as a result of OPEC price hikes. This sluggishness persisted through 1975 as the domestic recession set in.



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	111844.8	-	88
H#	1968	125380.8	12.1	88
I	1969	136014.9	8.5	86
S	1970	139669.2	2.7	82
T	1971	151042.9	8.1	78
O	1972	182650.0	20.9	77
R	1973	253284.6	38.7	82
Y	1974	249885.4	-1.3	82
	1975	254092.6	1.7	84
F				
O				
R	1980	404888.7	9.8	-
E	1985	430862.7	1.3	-
C	1990	450244.9	0.9	-
A	1995	474794.2	1.1	-
S	2000	500682.1	1.1	-
T				

* BASED ON VOLUME.

# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR
WATERBORNE OIL IMPORTS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Venezuela	41	35	27	23	16
Netherlands Antilles	15	12	13	11	8
Saudi Arabia	4	6	9	8	13
Nigeria	3	7	8	14	14
Iran	4	4	4	10	6
Indonesia	3	4	4	6	8
Algeria	1	3	3	4	6
Trinidad and Tobago	7	7	6	6	5
Other	22	22	26	18	24
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

Major suppliers of these imports in 1975 were: Venezuela (16 percent), Nigeria (14 percent) and Saudi Arabia (13 percent). From 1967 to 1975 Venezuela and Netherlands Antilles together lost 22 percent of the U.S. market while Saudi Arabia and Nigeria gained 20 percent (Table B).

The forecast, which is based on DRI's projection of real U.S. imports of fuels and lubricants, calls for a sharp increase over the next five years and more moderate growth thereafter as the Alaskan pipeline becomes fully operational and, as a likely result of a forthcoming U.S. energy policy. The waterborne share is expected to grow even faster as oil from Canada (85 percent overland in 1975) is diverted to waterborne sources.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports (all modes of transportation)} = 10.84 + \underset{(7.62)}{408.94}(\text{Real U.S. Imports of Fuels and Lubricants})$$

$R^2 = .99$

The waterborne share of the total oil import tonnage is assumed to converge in a straight line fashion from .84 in 1975 to 1.00 in 1980-2000. Forecast from 1990 to 2000 is based on 1980 to 1990 growth rate.

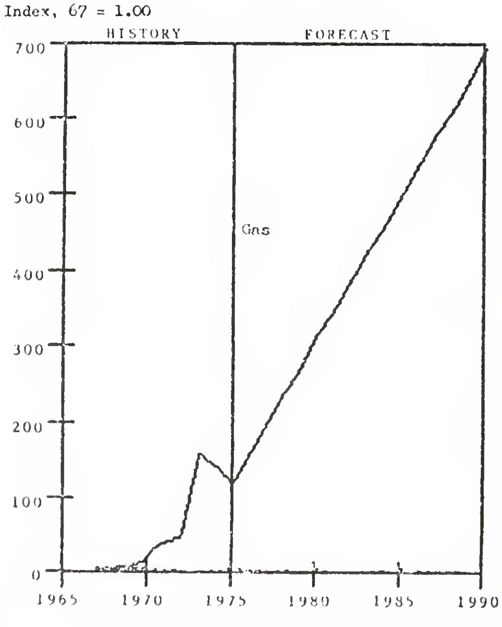
GAS

Schedule A Code: 341

Description: Gas was 1.0 percent of the total waterborne import volume in 1975. The waterborne share of total gas imports grew from virtually nothing in 1967 to 19 percent in 1974 and then fell to 10 percent in 1975.

Major sources in 1975 were Venezuela (46 percent), Saudi Arabia (23 percent) and Algeria (14 percent). Venezuela's share has fallen sharply from 80 percent in 1974 while Saudi Arabia's share has grown 13 percent over the same period.

The historical growth of these imports has been extremely high. From 11.5 thousand long tons in 1967 they peaked at 1818.1 thousand long tons in 1973. Growth was largely due to the increase in waterborne share which resulted from the emergence of the world LNG fleet. Of course this growth also reflects the energy needs of the U.S. economy.



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY	1967	11.5	-	0
	1968	28.8	150.7	1
	1969	51.0	77.5	1
	1970	174.9	242.6	2
	1971	484.8	177.2	2
	1972	537.3	10.8	3
	1973	1818.1	238.4	15
	1974	1565.5	-13.9	19
	1975	1340.3	-14.4	10
FORECAST	1980	3540.2	21.4	-
	1985	5658.2	9.8	-
	1990	7928.6	7.0	-
	1995	11865.4	8.4	-
	2000	17756.8	8.4	-

* BASED ON DOLLAR VALUE.
' SOURCE: BUREAU OF THE CENSUS. SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE GAS IMPORTS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Venezuela	70	76	74	80	46
Saudi Arabia	7	4	4	10	23
Algeria	11	10	4	-	14
Other	12	10	18	10	17
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The forecast, based on the relation between gas imports and U.S. industrial production, calls for continued strong growth. It should be noted that this is a forecast of the waterborne share, not the total. Implicit is the growth of this share over time. A major uncertainty are domestic price controls on interstate gas. A phase out of these controls would mean a downward adjustment to the forecast. The forecast also assumes adequate expansion of fleets and port facilities to accommodate the trade.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = -12982.58 + \underset{(2.15)}{4347.92}(\text{U.S. Industrial Production}) + \underset{(1.99)}{123.81}(\text{Time})$$

$R^2 = .87$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

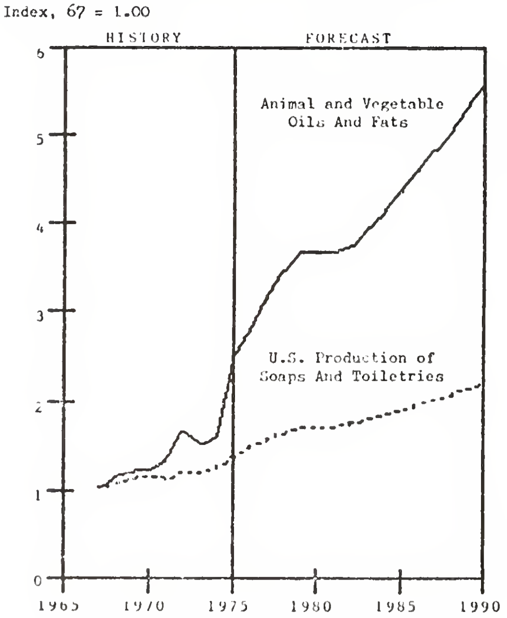
ANIMAL AND VEGETABLE OILS AND FATS

Schedule A Codes: 4 - animal and vegetable oils and fats which includes: 411 - animal oils and fats, n.e.s.; 421 - vegetable oils -- fixed, soft, except hydrogenated; 422 - vegetable oils, n.e.s.; and 431 - fatty acids, waxes, and specially treated fats and oils.

Composition: 83 percent 422; 8 percent 421; 7 percent 411 and 2 percent 431.

Description: This group accounted for 0.8 percent of the non-oil waterborne import volume in 1975; up sharply from 0.2 percent in 1974. Virtually all of these imports are shipped by vessel (Table A).

Pronounced shifts have occurred among the major countries of origin from 1971 to 1975. The Phillipines' share dropped from 50 percent to 38 percent while Malaysia increased its share from 8 percent to 41 percent (Table B).



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	410.5	-	99
	1968	470.2	14.5	99
	1969	494.2	5.1	99
	1970	497.6	0.7	99
	1971	540.5	8.6	98
	1972	684.3	26.6	99
	1973	603.2	-11.9	99
	1974	655.0	8.6	99
	1975	1010.8	54.3	99
FORECAST	1980	1513.0	8.4	-
	1985	1791.6	3.4	-
	1990	2286.7	5.0	-
	1995	2811.2	4.2	-
	2000	3455.9	4.2	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF ANIMAL AND VEGETABLE OILS AND FATS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Phillipines	50	50	43	37	38
Malaysia	8	18	21	26	41
Brazil	8	7	7	12	4
Indonesia	10	10	11	9	4
Other	24	15	18	14	13
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The historical growth, although more volatile, has paralleled that of U.S. soap and toiletry production. The forecast, based on this relation, calls for import growth of 8.4 percent per year to 1980 and 3 to 5 percent per year thereafter. In terms of tonnage, by 2000 these imports will grow to 3.4 million long tons, or more than 3 times the 1975 level.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = -65.96 + \underset{(2.93)}{2037.53}(\text{U.S. Industrial Production--Soaps and Toiletries}) - \underset{(-0.82)}{23.77}(\text{Time}) - \underset{(-1.11)}{96.27}(\text{Dummy, 1969})$$

$R^2 = .90$

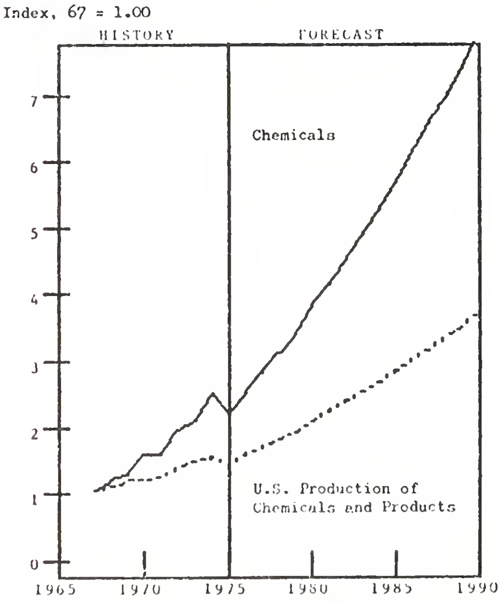
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

CHEMICALS

Schedule A Codes: 5 - chemicals which includes: 521 - organic chemicals; 513 - inorganic chemical elements; 514 - inorganic chemicals excluding elements; 515 - radioactive and stable isotopes; 521 - mineral tars, tar oils and crude chemicals from petroleum, coal and natural gas; 531 - synthetic organic dyestuffs; 532 - dyeing and tanning extracts; 533 - pigments, paints and related materials; 541 - medicinal and pharmaceutical products; 551 - essential oils; 553 - perfumery and cosmetics; 554 - soaps; 561 - fertilizers; 571 - explosives; 581 - synthetic resin and 599 - chemical products and materials, n.e.s.

Composition: 53 percent 513; 20 percent 512; 19 percent 561; 2 percent 514; 2 percent 581; 2 percent 599; and negligible amounts of each of the remaining.

Description: Chemicals, organic, inorganic and fertilizers, accounted for 5.9 percent of total non-oil import volume in 1975. The major sources of these imports were Australia (26 percent), Holland (10 percent) Jamaica (9 percent) and Japan (8 percent). (See Table B.) During the period 1967-75, the



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	3506.6	-	64
H#	1968	4296.2	22.5	66
I	1969	4468.7	4.0	63
S	1970	5590.5	25.1	67
T	1971	5629.7	0.7	65
O	1972	6920.2	22.9	67
R	1973	7344.1	6.1	66
Y	1974	8814.4	20.0	72
	1975	7608.4	-13.7	69
F				
O				
R	1980	13334.7	11.9	-
E	1985	19962.3	8.4	-
C	1990	28010.3	7.0	-
A	1995	40596.3	7.7	-
S	2000	58837.5	7.7	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR
WATERBORNE CHEMICAL IMPORTS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Australia	18	15	24	23	26
Japan	12	13	9	8	8
Surinam	7	8	5	5	6
Holland	6	7	10	13	10
Canada	11	7	6	4	6
Jamaica	7	10	11	9	9
Germany	6	6	6	8	6
Italy	5	5	5	4	3
Other	28	29	24	26	26
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

waterborne share of total chemical imports fluctuated between 63 percent in 1969 to 72 percent in 1974 (Table A). Generally the waterborne share seemed to be higher in the years when there were increases in import volumes.

Although the annual growth pattern alternated between high and low growth, the volume of chemical imports steadily increased and more than doubled from 3.5 million tons in 1967 to 7.6 million tons in 1975. The import of chemicals is very sensitive to U.S. demand for chemicals reflected in the domestic production volume.

The forecast shows an average annual growth rate of 11.9 percent between 1975 and 1980, and approximately 7.0 to 8.4 percent rate thereafter. In terms of volumes, by 1980 imports will nearly double reaching 13.3 million long tons, and by 2000 they will grow to 58.8 million long tons, about an eight fold increase over the 1975 level.

Forecast from 1976 to 1990 based on the following equation:
Imports = -5408.30 + 8907.00(U.S. Industrial Production--Chemical Products) -
(12.21)
845.57(Dummy, 1969)
(-2.07)

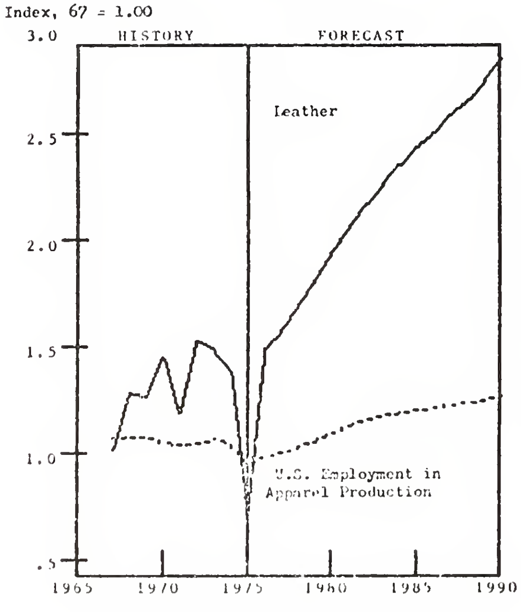
$R^2 = .97$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

LEATHER GROUP

Schedule A Codes: 61 - leather, leather manufactures, n.e.s.; and dressed furskin which includes: 611 - leather; 612 - leather manufactures, n.e.s.; and 613 - dress furskins.

Composition: 50 percent 612; 49 percent 611.

Description: Leather was only .01 percent of the total non-oil import volume in 1975. Major exporters to the U.S. were: Argentina (17 percent), Japan (14 percent), England (13 percent),France (12 percent), Korea (8 percent), and China (8 percent). (See Table B.) The share of Japan declined from 25 percent in 1971 to 14 percent in 1975 as China and Korea took over Japan's lost share. The waterborne share of the total shipments has declined during the nine years from 63 percent in 1967 to 41 percent in 1975.



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	18.1	-	63
H#	1968	23.0	27.3	57
I	1969	22.6	-1.8	54
S	1970	26.1	15.4	59
T	1971	21.2	-18.7	47
O	1972	27.5	29.5	50
R	1973	26.6	-3.3	54
Y	1974	24.6	-7.4	51
	1975	12.8	-48.1	41
F				
O				
R	1980	34.7	22.1	-
E	1985	44.0	4.8	-
C	1990	51.5	3.2	-
A	1995	62.8	4.0	-
S	2000	76.4	4.0	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR
WATERBORNE LEATHER IMPORTS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Japan	25	28	29	24	14
Argentina	14	16	16	19	17
England	11	9	9	10	13
France	8	8	9	9	12
Korea	-	2	5	7	8
China	-	1	2	6	8
Other	42	36	30	25	28
Total					

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

Out of nine years, five years experienced a decline in import volumes. Declines were partially due to dock strikes in 1969 and 1971, but mainly in response to declining U.S. apparel production which uses leather as a raw material. U.S. apparel production has been declining due to increased importation of finished leather goods. (See clothing, shoes and luggage.) In spite of an erratic annual growth pattern, if we disregard 1975 data, there appears to be an upward secular trend.

The forecast shows that by 1976, the import volume will rebound from the 1975 low to the path of the secular trend, and will continue to grow at an annual rate of 3 to 4 percent. Any voluntary or legal trade agreements between the U.S. and leather goods exporting countries would undoubtedly change the shape of the forecast.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = -84.62 + \underset{(0.69)}{26.12}(\text{U.S. Employment--Apparel Production}) + \underset{(2.24)}{1.02}(\text{Time}) - \underset{(-2.00)}{11.57}\ (\text{Dummy, 1975}) \qquad R^2 = .81$$

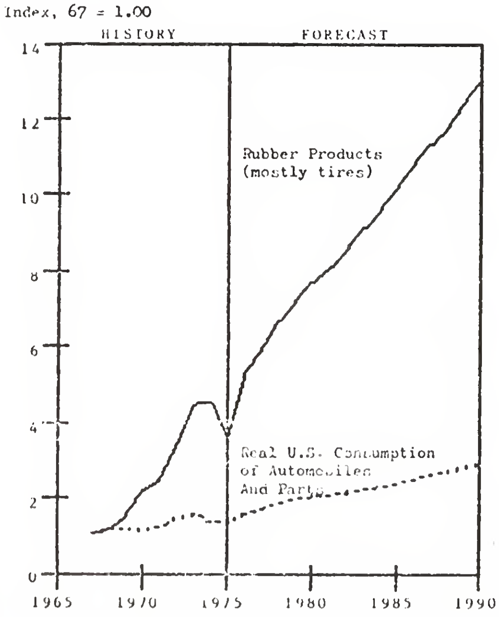
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

RUBBER MANUFACTURES

Schedule A Codes: 629 - rubber manufactures (mostly tires and tubes)

Description: In 1975 this group accounted for only 0.2 percent of non-oil waterborne import volume. The waterborne share of total imports of rubber manufactures has ranged from 81 percent to 91 percent with no discernible trend over the historical period (Table A). The major countries of origin for these imports in 1975 were: France (20 percent), Japan (18 percent), Italy (13 percent), Spain (13 percent), Germany (11 percent) and England (5 percent). (See Table B.) Japan's share is down from 32 percent in 1971, while the European countries have, except for England, registered moderate gains.

This group experienced double-digit growth in each of the years from 1968 to 1973. A small increase, 2.3 percent, was registered in 1974 followed by a sharp decline, -21 percent,



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	56.4	-	81
H#	1968	67.9	20.4	91
I	1969	85.2	25.5	89
S	1970	122.3	43.6	87
T	1971	138.0	12.8	84
O	1972	187.2	35.7	87
R	1973	250.6	33.8	87
Y	1974	256.4	2.3	89
	1975	202.5	-21.0	84
F				
O				
R	1980	433.0	16.4	-
E	1985	574.0	5.8	-
C	1990	734.7	5.1	-
A	1995	957.0	5.4	-
S	2000	1246.6	5.4	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR
WATERBORNE RUBBER IMPORTS
Percent Of Total Weight

	1971	1972	1973	1974	1975
France	16	18	18	18	20
Italy	10	9	11	11	13
Germany	8	9	12	15	11
Spain	5	5	7	10	13
England	8	6	6	5	6
Japan	32	29	19	17	18
Other	21	24	27	24	19
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305,

with the recession of 1975. This growth pattern parallels, with greater amplitude, that of U.S. real consumption spending on autos and parts.

The forecast, based on the relation of these two series, calls for slower growth than in the past. Both series reflect a slowdown in the growth of U.S. driving population.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = -1387.31 + \underset{(1.68)}{3.56}(\text{Real U.S. Consumption Expenditures-- Automobiles and Parts}) + \underset{(4.01)}{19.57}(\text{Time}) - \underset{(-1.01)}{22.71}(\text{Dummy, 1969,1971})$$

$R^2 = .92$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

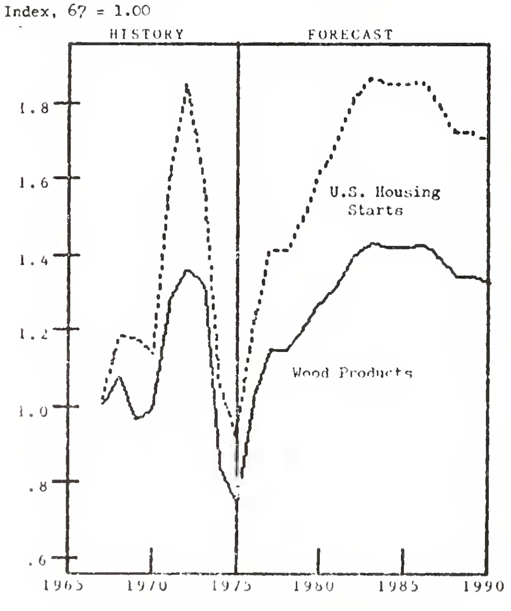
WOOD PRODUCTS

Schedule A Codes: 63 - Wood and cork manufactures, n.e.s. which includes: 631 - wood veneers, plywood boards, improved or reconstituted wood, and other wood, worked, n.e.s.; 632 - wood manufactures, n.e.s.; and 633 - cork manufactures.

Composition: 91 percent 631; 8 percent 632; and negligible amounts of the remaining.

Description: This group accounted for 1.1 percent of the non-oil waterborne import tonnage in 1975. The waterborne share of total imports of wood products has ranged from 78 percent in 1970 to 70 percent in 1975--a steady decline from 1972 to 1975 (Table A). Major countries of origin for the waterborne share in 1975 were: Canada (31 percent), Korea (32 percent), China (15 percent), Philippines (7 percent) and Japan (6 percent). (See Table B.)

The historical growth of these imports appears closely related to U.S. housing starts.



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	1956.3	-	74
HISTORY#	1968	2105.8	7.6	76
	1969	1876.3	-10.9	77
	1970	1939.2	3.4	78
	1971	2486.1	28.2	75
	1972	2653.2	6.7	76
	1973	2564.8	-3.3	75
	1974	1630.8	-36.4	73
	1975	1449.0	-11.1	70
FORECAST	1980	2488.5	11.4	-
	1985	2763.0	2.1	-
	1990	2576.7	-1.4	-
	1995	2621.9	0.3	-
	2000	2668.0	0.3	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF WOOD PRODUCTS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Canada	43	32	40	35	31
Korea	18	23	21	22	32
China	12	16	12	13	15
Phillipines	9	10	12	10	7
Japan	8	7	4	5	6
Other	10	12	11	15	9
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The forecast, based on this relation, shows a recovery through 1983, followed by a mild decline. The growth pattern for both series reflects principally the impact of the post WW II baby boom on the U.S. housing market.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = 539.30 + \underset{(6.93)}{947.40}(\text{U.S. Housing Starts}) - \underset{(-0.42)}{71.92}(\text{Dummy, 1969})$$

$R^2 = .89$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

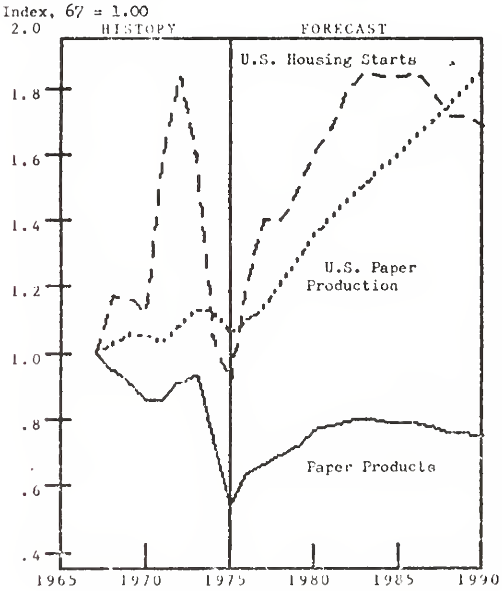
PAPER PRODUCTS

Schedule A Codes: 64 - paper, paperboard and manufactures thereof which includes: 641 - paper and paperboard; and 642 - paper, paper pulp and paperboard articles, n.e.s.

Composition: 98 percent 641.

Description: This group accounted for 1.1 percent of the non-oil waterborne import volume in 1975, down from 1.8 percent in 1973. The waterborne share of total imports of paper products declined from 41 percent in 1967 to 27 percent in 1975. Canada is the principal source for the waterborne share, accounting for 86 percent in 1975. Finland is the only other major supplier with 6 percent in 1975.

Three factors appear to have influenced the historical growth of these imports: U.S. housing starts; U.S. paper production; and the loss in waterborne share.



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	2668.7	-	41
H#	1968	2492.6	-6.6	39
I	1969	2385.7	-4.3	35
S	1970	2260.2	-5.3	35
T	1971	2263.5	0.1	31
O	1972	2428.6	7.3	32
R	1973	2490.6	2.6	33
Y	1974	1941.7	-22.0	27
	1975	1431.2	-26.3	27
F				
O				
R	1980	2038.8	7.3	-
E	1985	2086.0	0.5	-
C	1990	1968.3	-1.2	-
A	1995	1934.0	-0.4	-
S	2000	1900.3	-0.4	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF PAPER PRODUCTS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Canada	76	72	70	72	86
Finland	16	16	19	15	6
Other	8	12	11	13	8
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The forecast reflects the pattern projected for U.S. housing starts. The positive impact of U.S. paper production and the negative effect of the declining waterborne share cancel out. The growth projected for housing starts and waterborne imports of paper products in turn reflects the impact of the post WW II baby boom on the domestic housing market.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Log}_{10}\text{Imports} = 11.52 + \underset{(3.00)}{.30}\text{Log}_{10}(\text{U.S. Housing Starts}) + \underset{(1.74)}{1.53}\text{Log}_{10}(\text{U.S. Industrial Production--Paper}) - \underset{(-3.71)}{4.47}\text{Log}_{10}(\text{Time}) - \underset{(-.80)}{.04}(\text{Dummy, 1975})$$

$R^2 = .96$

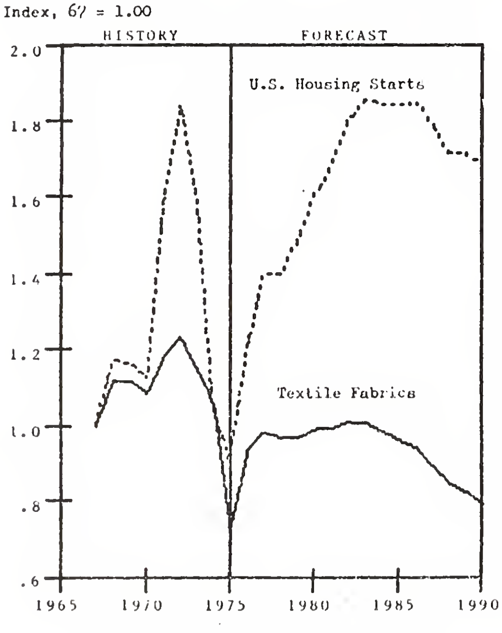
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

TEXTILE YARNS AND FABRICS

Schedule A Codes: 65 - textile yarns, fabrics, made-up articles and related products which includes: 651 - textile yarn and thread; 652 - cotton fabrics; 653 - textile fabrics other than cotton; 654 - tulle, lace, embroidery, ribbons, trimmings and other small wares; 655 - special textile fabrics; 656 - made-up articles wholely or chiefly textile material, n.e.s.; and 657 - floor coverings.

Composition: 43 percent 653; 21 percent 655; 14 percent 652; 12 percent 651; 6 percent 657; 4 percent 656; and negligible amounts of 654.

Description: In 1975 this group accounted for .4 percent of the non-oil waterborne import tonnage. The waterborne share of total yarn and fabric imports has ranged from 88 percent in 1967 to 80 percent in 1971 with a declining trend over the entire historical period, 1967-1975 (Table A). The largest supplier of the waterborne share was India with 26 percent in 1975. Other major suppliers were Bangladesh (15 percent) and Japan (10 percent) (See Table B.)



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	774.4	-	88
H#	1968	867.7	12.1	87
I	1969	855.5	-1.4	85
S	1970	831.7	-2.8	85
T	1971	908.5	9.2	80
O	1972	954.9	5.1	81
R	1973	882.8	-7.6	82
Y	1974	812.1	-8.0	83
	1975	561.7	-30.8	81
F				
O				
R	1980	762.5	6.3	-
E	1985	737.6	-0.7	-
C	1990	604.7	-3.9	-
A	1995	538.5	-2.3	-
S	2000	479.5	-2.3	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305. FT 150. "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF TEXTILE YARNS AND FABRICS
Percent Of Total Weight

	1971	1972	1973	1974	1975
India	31	34	30	33	26
Japan	15	11	8	8	10
Bangladesh	-	6	15	13	15
Hong Kong	4	5	5	5	6
Germany	7	6	5	4	3
Brazil	3	3	3	4	4
Portugal	4	4	3	5	3
Other	36	31	31	28	33
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The historical growth of these imports parallels that of U.S. housing starts. In addition to housing, textile materials are used in apparel and other consumer goods. Since all uses relate to demographic factors, housing starts serves as a proxy for total import demand.

The forecast, based on U.S. housing starts, reflects the changing age composition of U.S. population. The movement of large numbers of postwar babies into high consuming, household forming groups will stimulate the demand for imports of yarns and fabrics through the mid-1980's. Thereafter, as the group grows into middle age, demand will soften.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = \underset{}{1733.38} + \underset{(4.13)}{222.23}(\text{U.S. Housing Starts}) - \underset{(-2.20)}{17.85}(\text{Time})$$

$R^2 = .77$

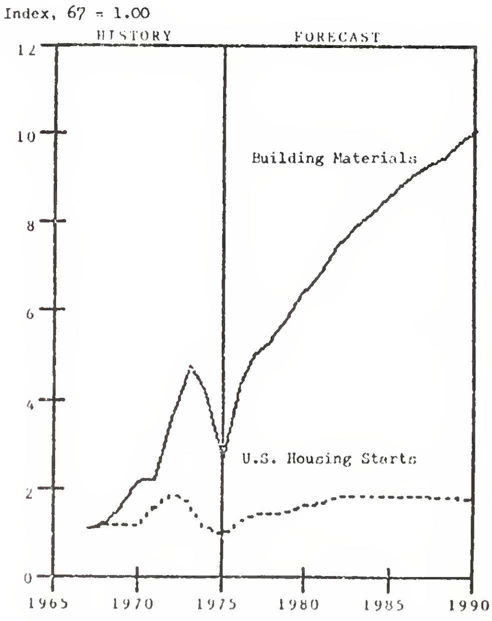
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

BUILDING MATERIALS

Schedule A Code: 661 - Lime, cement, and other fabricated building materials except clay and glass.

Description: This group represented 2.1 percent of the U.S. non-oil waterborne import volume in 1975, down sharply from 3.6 percent in 1973. The waterborne share of total imports of building materials fell from 88 percent in 1967 to a nine year low of 74 percent in 1971, a year in which Gulf, Atlantic and Pacific port operations were severely hampered by dock strikes. The waterborne share recovered to 79 percent in 1972-73, but fell again in 1974-75 (Table A). Canada is the largest supplier with 36 percent in the market in 1975. Other major sources are Norway (12 percent) and the Bahamas (11 percent). (See Table B.)

The historical growth of these imports is similar to that of U.S. housing starts. 1971 is an obvious exception due to the dock strikes. The upward trend of these imports



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	1055.0	-	88
	1968	1295.2	22.8	88
	1969	1644.9	27.0	82
	1970	2276.8	38.4	81
	1971	2291.9	0.7	74
	1972	3745.3	63.4	79
	1973	4995.0	33.4	79
	1974	4228.7	-15.3	78
	1975	2740.5	-35.2	76
FORECAST	1980	6813.9	20.0	-
	1985	9108.5	6.0	-
	1990	10639.6	3.2	-
	1995	13295.1	4.6	-
	2000	16613.4	4.6	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305. FT 150. "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF BUILDING MATERIALS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Canada	35	32	28	24	36
Norway	17	14	12	14	12
Bahamas	30	23	17	18	11
England	2	9	21	14	7
Spain	-	3	7	6	10
Other	16	19	15	24	24
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

received additional impetus following the closing of several domestic cement plants (attributed to stringent environmental regulations) in 1969. The sharp decline in 1974-75 reflected the near-depression collapse of the domestic construction industry.

A strong recovery is anticipated for the U.S. construction industry through the mid-1980's. This should bolster imports of building materials. However, in subsequent years demand will soften reflecting slower growth in household formation (resulting from aging of postwar baby boom).

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = \underset{}{-25852.90} + \underset{(2.44)}{1570.00}(\text{U.S. Housing Starts-1}) + \underset{(4.07)}{367.97}(\text{Time}) - \underset{(-1.48)}{1176.96}(\text{Dummy, 1971})$$

$R^2 = .84$

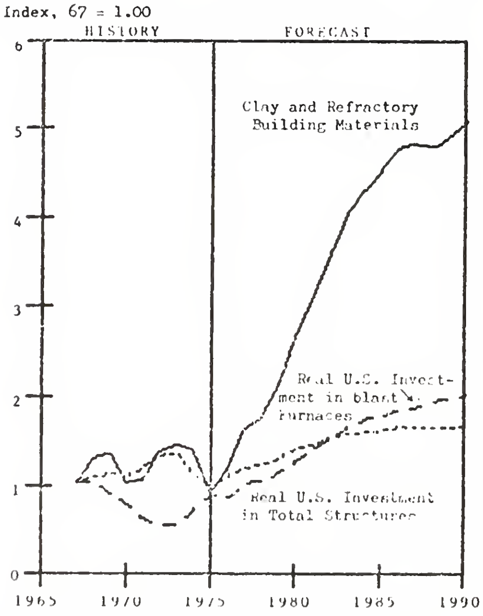
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

CLAY AND REFRACTORY BUILDING MATERIALS

Schedule A Code: 662

Description: Clay and refractory building materials, which are mainly used in building blast furnaces and other structures, accounted for 0.1 percent of total non-oil import tonnage in 1975. Two chief exporters are Japan (37 percent) and Italy (22 percent). Germany (13 percent) and England (8 percent) also shipped significant amounts to the U.S. While Japan and England lost their shares, Italy and Germany gained during the last five years. On the average 74 percent of the total shipments in value were waterborne.

The historical data shows annual fluctuations in waterborne import volumes, partially due to dock strikes affecting Gulf, Pacific, and Atlantic coasts (1969 and 1971), but more importantly due to U.S. economic conditions reflected in



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	136.2	-	75
H#	1968	178.4	31.0	79
I	1969	183.4	2.8	82
S	1970	136.3	-25.7	74
T	1971	140.6	3.2	71
O	1972	186.0	32.3	73
R	1973	198.7	6.8	72
Y	1974	181.9	-8.5	75
	1975	120.5	-33.8	69
F				
O				
R	1980	363.0	24.7	-
E	1985	617.2	11.2	-
C	1990	691.4	2.3	-
A	1995	954.2	6.7	-
S	2000	1317.0	6.7	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF CLAY AND REFRACTORY BUILDING MATERIALS

Percent Of Total Volume

	1971	1972	1973	1974	1975
Japan	64	62	51	40	37
Italy	8	11	14	19	22
England	15	12	14	14	8
Germany	4	3	4	5	13
Other	9	12	17	22	20
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

real investment in structures. In 1970, 1974 and 1975 declines were registered both in import tonnage of clay-and-refractory building materials and real U.S. investment in total structures.

The forecast calls for a drastic increase (24.7 percent) in import volumes during 1976-80 followed by somewhat slower growth rates. This forecast is made under an assumption that real U.S. investment in blast furnaces and other structures will continue to grow in the future.

Forecast from 1976 to 1990 based on the following equation:

$$\mathrm{Log}_{10}\mathrm{Imports} = -2.46 + \underset{(2.06)}{.56}\mathrm{Log}_{10}(\text{Real U.S. Investment in Plant and Equipment--Blast Furnaces}) + \underset{(3.89)}{2.33}\mathrm{Log}_{10}(\text{Real U.S. Investment in Structures}) - \underset{(-1.53)}{.07}(\text{Dummy, 1971})$$

$R^2 = .83$

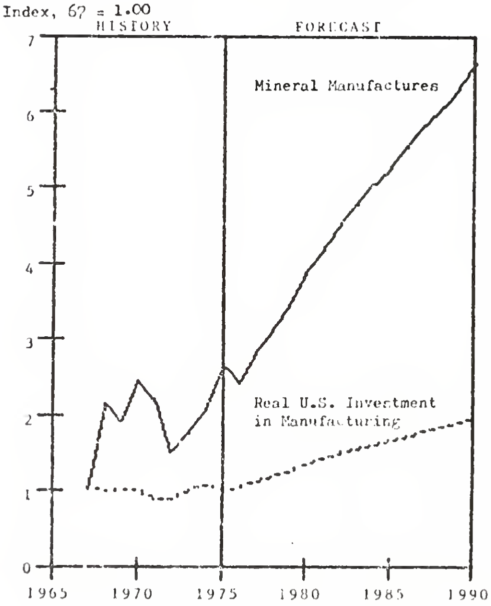
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

MINERAL MANUFACTURES, N.E.S.

Schedule A Code: 663

Description: Composed mainly of manufactures of mineral materials this commodity group accounted for .05 percent of total non-oil waterborne import tonnage in 1975. Canada with 44 percent of import share is the dominant exporter of manufactures of mineral materials. England (9 percent), Germany (9 percent), Japan (8 percent) and Italy (7 percent) also shipped these commodities to the U.S. (Table B). The waterborne share of the trade declined from 64 percent in 1967 to a low of 51 percent in 1972, but regained to the level of 59 percent in 1975 (Table A).

During the nine-year history, real U.S. investment in manufacturing hardly grew but experienced annual fluctuations. Although the import volume of mineral manufactures during



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	22.3	-	64
HISTORY#	1968	47.5	112.9	65
	1969	41.7	-12.2	55
	1970	54.1	29.8	58
	1971	48.5	-10.4	56
	1972	32.5	-33.1	51
	1973	38.9	19.9	53
	1974	45.6	17.1	55
	1975	58.7	28.6	59
FORECAST	1980	85.6	7.8	-
	1985	117.3	6.5	-
	1990	147.5	4.7	-
	1995	193.7	5.6	-
	2000	254.3	5.6	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE
IMPORTS OF MINERAL MANUFACTURES
Percent Of Total Weight

	1971	1972	1973	1974	1975
Canada	53	24	20	18	44
England	10	14	13	11	9
Germany	8	11	13	13	9
Italy	7	15	16	15	7
Japan	4	6	7	8	8
Other	18	30	31	35	23
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

the same period increased by more than 2-1/2 times, ups and downs of import volume of mineral manufactures closely followed (in signs) those of U.S. investment in manufactures except in 1967-1968. The severe falls in 1969 and 1971 are partially explained by dock strikes, and a drastic decline in 1972 by the drop in real U.S. investment in manufactures.

As the U.S. economy picks up after 1976, the forecast calls for sustained growth in both series.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = -52.13 + \underset{(6.27)}{2.80}(\text{Real U.S. Investment--Manufacturing}) - \underset{(-8.35)}{29.72}(\text{Dummy, 1967})$$

$R^2 = .94$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

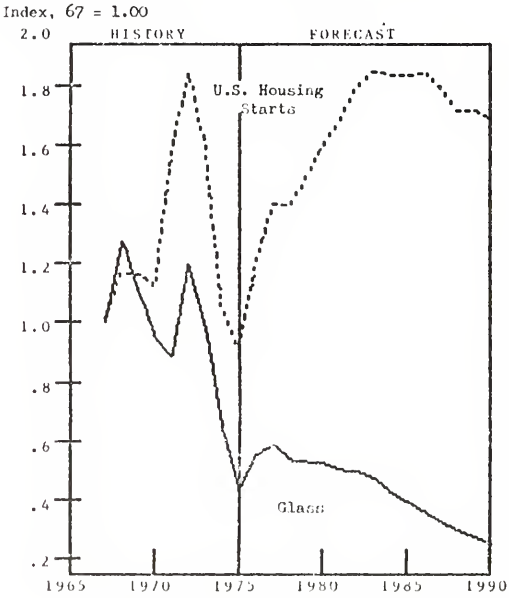
GLASS

Schdeule A Code: 664

Description: These imports were .1 percent of the non-oil waterborne imports tonnage in 1975. The waterborne share of total imports of glass decined in five of the eight years shown or 34 percent from 1967 to 1975 (Table A). Major suppliers of the waterborne share in 1975 were: Japan (18 percent), Romania (18 percent) and Germany (12 percent). (See Table B.)

Growth of these imports has been similar to that of U.S. housing starts. Losses to other modes of transportation have nevertheless retarded the growth potential of the waterborne segment.

If this modal trend continues, the positive impact of the expected recovery in U.S. housing starts on waterborne glass imports will be shortlived.



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	363.1	-	86
H#	1968	462.5	27.4	83
I	1969	400.9	-13.3	75
S	1970	344.1	-14.2	67
T	1971	316.8	-8.0	59
O	1972	434.2	37.1	63
R	1973	350.0	-19.4	57
Y	1974	228.8	-34.6	58
	1975	156.1	-31.8	52
F				
O				
R	1980	185.6	3.5	-
E	1985	138.8	-5.7	-
C	1990	85.4	-9.3	-
A	1995	57.9	-7.5	-
S	2000	39.3	-7.5	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305, FT 150, "U.S. GENERAL IMPORTS"

Table B

MAJOR COUNTRIES OF ORIGIN FOR
WATERBORNE GLASS IMPORTS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Germany	11	9	7	9	12
Japan	13	18	17	16	18
Romania	4	8	12	11	18
Belgium and Luxembourg	21	17	10	9	6
Spain	3	4	6	11	8
Soviet Union	5	4	7	6	8
England	4	5	5	5	6
Other	39	35	36	33	24
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Log}_{10}\text{Imports} = 15.22 + \underset{(7.58)}{1.00}\text{Log}_{10}(\text{U.S. Housing Starts}) - \underset{(-9.07)}{6.97}\text{Log}_{10}(\text{Time}) - \underset{(-3.19)}{.13}(\text{Dummy, 1971})$$

$R^2 = .96$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

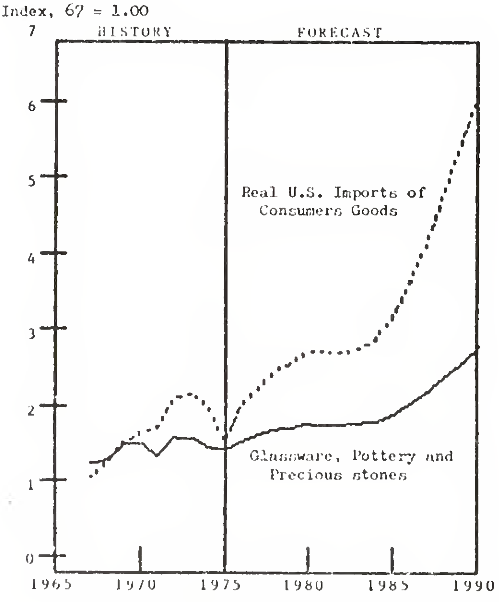
GLASSWARE, POTTERY AND PRECIOUS STONES

Schedule A Codes: Includes: 665 - glassware; 666 - pottery; and 667 - precious stones.

Composition: 76 percent 666; 23 percent 665.

Description: This group occupied .2 percent of total non-oil waterborne import volume in 1975. Japan led the export countries with 43 percent of share followed by Italy with 16 percent (Table B). Composed of relatively high priced precious stones, pottery, and glasswares, a small percentage (22-29 percent) of total imports are shipped by water (Table A).

During the nine-year period (1967-75), the import volume fell in 1971 due to Pacific Coast dock strikes, and during 1973-75 due to unfavorable economic condition. While as non-competitive items, they are less subject to severe fluctuations, as luxury items, they are to some extent



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	178.0	-	22
H#	1968	193.2	8.5	22
I	1969	230.3	19.2	24
S	1970	230.6	0.1	29
T	1971	194.4	-15.7	24
O	1972	246.8	26.9	26
R	1973	245.4	-0.6	24
Y	1974	219.3	-10.6	27
	1975	216.6	-1.2	27
F				
O				
R	1980	278.5	5.2	-
E	1985	301.7	1.6	-
C	1990	459.1	8.8	-
A	1995	589.4	5.1	-
S	2000	756.8	5.1	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF GLASSWARE, POTTERY AND PRECIOUS STONES
Percent Of Total Weight

	1971	1972	1973	1974	1975
Japan	63	60	54	47	43
Italy	7	8	9	10	16
France	3	3	4	6	6
Germany	5	5	6	6	6
Other	22	24	27	31	29
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

sensitive to the importing nation's economic condition. All in all, there has been a small gain in import volume from 178,000 LT in 1967 to 217,000 LT in 1975.

The forecast identifies three alternating periods of growth, nongrowth, and growth closely following the similar pattern of U.S. imports of consumers goods. During 1978-80, the volume of imports will grow at 5.2 percent annual growth rate; drop to mere 1.6 percent rate between 1980-85, and regain growth momentum thereafter.

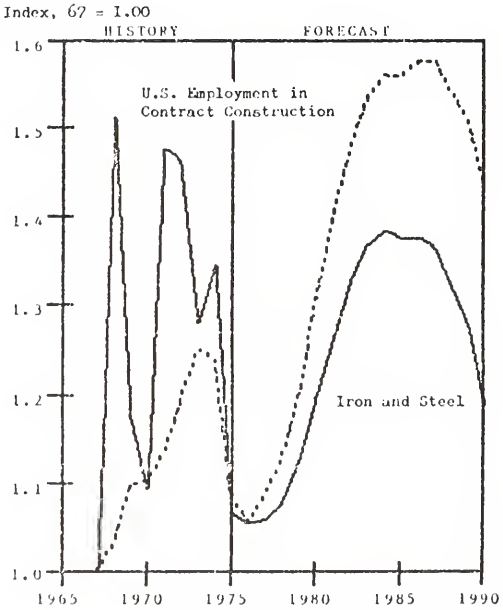
Forecast from 1976 to 1990 based on the following equation.
Imports = 132.63 + 12.68(Real U.S. Imports of Consumers Goods) -29.72(Dummy, 1971)
(4.95)
(-2.44)
$R^2 = .83$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

IRON AND STEEL

Schedule A Codes: 67 - Iron and steel which includes: 671 - pig iron, sponge iron, iron and steel powder and shot, and ferroalloys; 672 - iron and steel primary forms; 673 - iron and steel plates and sheets; 675 - iron and steel hoop and strip and flat wire; 676 - iron and steel rails and railway track construction material; 677 - iron and steel wire except flat wire; 678 - iron and steel tubes, pipes and fittings; 679 - iron and steel castings and forgings.

Composition: 4 percent 674; 23 percent 673; 12 percent 678; 11 percent 671; 3 percent 677; 2 percent 672; 1 percent 675; and 1 percent 676.

Description: This group amounted to 8.6 percent of the non-oil waterborne import volume in 1975. Japan is the major exporter of steel to the U.S. Nearly one-half of all waterborne iron and steel imports to the U.S. were from Japan in 1975. Germany (9 percent), France (7 percent), and Belgium and Luxembourg (5 percent), followed suit (Table B). Because of its heavy weight, 90 percent or more of all iron and steel imports were shipped by water (Table A).



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	10413.9	-	91
H#	1968	15727.2	51.0	90
I	1969	12204.3	-22.4	90
S	1970	11343.3	-7.1	90
T	1971	15371.5	35.5	90
O	1972	15170.0	-1.3	90
R	1973	13288.1	-12.4	91
Y	1974	14000.6	5.4	91
	1975	11043.0	-21.1	92
F				
O				
R	1980	12426.2	2.4	-
E	1985	14257.9	2.8	-
C	1990	12321.7	-2.9	-
A	1995	12269.8	-0.1	-
S	2000	12218.1	-0.1	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305. FT 150. "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF IRON AND STEEL

Percent Of Total Weight

	1971	1972	1973	1974	1975
Japan	40	38	37	39	49
Germany	15	14	15	14	9
Belgium and Luxembourg	11	10	9	10	5
France	9	8	8	9	7
Other	25	30	31	28	30
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

World steel trade is beset with problems and contraversy. Japan, trying to pay for its rising imports, has been sharply expanding its steel exports, to the chagrin of U.S. and European producers. The U.S. steel industry has been demanding that the government restrict steel imports from Japan. U.S. steel importers, on the otherhand, have asked that President Carter rescind the Ford Administration's import quotas on stainless and tool steel.

The U.S. steel market will, nevertheless, continue to attract the largest volume from exporters, especially Japan. Multinational trade negotiations are scheduled for 1977 and these may influence patterns of steel imports for the next few years. The U.S. is an overall net importer of both ferrous and nonferrous metals.

During the past nine years, there has been considerable year-to-year fluctuations in the waterborne volume of iron and steel imports. However, the comparison of 1967 and 1975 import volumes shows a negligible increase.

In the future, there will be undoubtedly wide-ranging annual fluctuations in this import, but the forecast, reflecting the expected growth pattern for U.S. construction employment, calls for slight growth over the long-term.

Forecast from 1976 to 1990 based on the following equation:

Imports = -40133.30 + 3281.09(U.S. Employment in Contract Construction) + 690.89
(1.02) (1.01)
(Time) - 7037.02(Composite Wholesale Price Index of Major U.S.Trading Partners)
(-1.32)
+ 4576.49(Dummy, 1968)
(2.67)

$R^2 = .74$

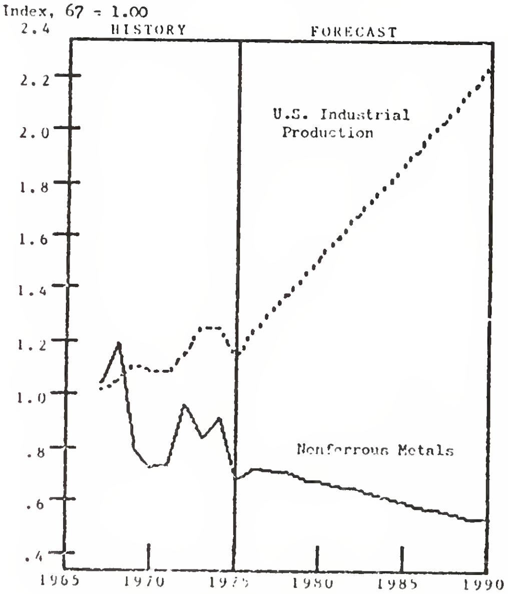
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

NONFERROUS METALS

Schedule A Codes: 68 - Nonferrous metals which includes: 681 - silver and platinum; 682 - copper and copper alloys; 683 - nickel and nickel alloys; 684 - aluminum and aluminum alloys; 685 - lead and lead alloys; 686 - zinc and zinc alloys; 687 - tin and tin alloys; 688 - uranium and thorium metal; 689 - base metals and alloys.

Composition: 30 percent 682; 26 percent 684; 24 percent 686; 7 percent 687; 5 percent 685; 4 percent 689; 3 percent 683.

Description: In 1975 these imports represented .5 percent of the non-oil waterborne import volume. The waterborne share of total nonferrous metal imports has fallen from 58 percent in 1967 to 43 percent in 1975 (Table A). This decline has been due to increasing overland shipments from Canada. The major sources for the waterborne share in 1975 were: Peru (10 percent), Japan 7 percent), Belgium and Luxembourg (7 percent), and Chile (7 percent). (See Table B.)



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	1089.2	-	58
H#	1968	1271.8	16.8	59
I	1969	830.1	-34.7	50
S	1970	750.1	-9.6	49
T	1971	765.8	2.1	45
O	1972	1018.2	33.0	47
R	1973	870.9	-14.5	45
Y	1974	960.3	10.3	48
	1975	703.5	-26.7	43
F				
O				
R	1980	695.6	-0.2	-
E	1985	606.5	-2.7	-
C	1990	541.5	-2.2	-
A	1995	477.7	-2.5	-
S	2000	421.5	-2.5	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF NONFERROUS METALS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Peru	18	15	16	16	10
Australia	10	7	10	5	4
Japan	6	7	8	17	7
Germany	6	7	6	5	6
Belgium and Luxembourg	5	8	8	5	7
Chile	6	5	6	12	7
Norway	7	7	2	2	5
Yugoslavia	3	4	3	4	6
England	3	5	5	4	3
France	4	5	4	3	3
Other	32	30	32	27	42
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The historical growth of these imports has been extremely erratic. Declines have been more pronounced than upturns. Two factors appear to explain this pattern: U.S. industrial production and the declining waterborne share.

A continuation of this decline in waterborne share will result in further reductions in seaborne volumes, although a sustained U.S. industrial recovery should soften the decline.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = 4872.09 + \underset{(1.04)}{688.61}(\text{U.S. Industrial Production}) \underset{(-3.26)}{-65.31}(\text{Time}) - \underset{(-3.66)}{262.73}$$

(Dummy, 1969 through 1971)

$R^2 = .83$

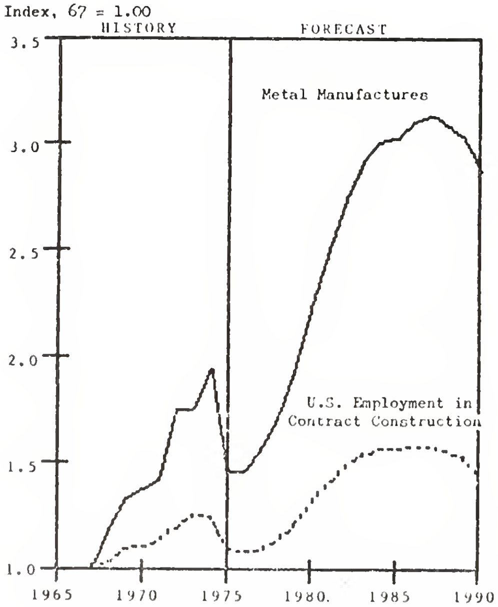
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

METAL MANUFACTURES

Schedule A Codes: 69 - metal manufactures which includes: 691 - finished structural parts and structures of metal; 692 - metal containers for storage or transport; 693 - wire products; 694 - nails, tacks, screws, nuts, bolts, rivets and similar articles of iron, steel and copper; 695 - tools; 696 - table flatware; 697 - household equipment; 698 - metal manufactures, n.e.s.

Composition: 37 percent 694; 21 percent 693; 20 percent 698; 8 percent 697; 5 percent 695; 4 percent 691; 3 percent 696; and 2 percent 692.

Description: This group represented only 0.9 percent of the U.S. non-oil import volume in 1975. The waterborne share of total imports of metal manufactures ranged from 71 percent in 1971 to 77 percent in 1967 with no discernible trend (Table A). Japan was the largest supplier of the waterborne share in 1975 with 56 percent of the trade. Other major suppliers were: Germany (5 percent), Taiwan (6 percent), Korea (5 percent), and Belgium and Luxembourg (4 percent). (See Table B.)



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	784.5	-	77
H#	1968	920.3	17.3	73
I	1969	1042.1	13.2	73
S	1970	1077.0	3.3	75
T	1971	1104.2	2.5	72
O	1972	1364.8	23.6	74
R	1973	1367.0	0.2	74
Y	1974	1516.5	10.9	76
	1975	1137.3	-25.0	74
F				
O				
R	1980	1744.2	8.9	-
E	1985	2373.7	6.4	-
C	1990	2235.5	-1.2	-
A	1995	2530.8	2.5	-
S	2000	2865.1	2.5	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305. FT 150. "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF METAL MANUFACTURES
Percent Of Total Weight

	1971	1972	1973	1974	1975
Japan	60	61	60	56	56
Belgium and Luxembourg	10	10	8	7	4
Germany	6	5	4	5	5
Korea	--	1	2	3	5
China	3	4	5	4	6
Other	21	19	21	25	24
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The historical growth pattern for these imports has been similar to that of U.S. employment in contract construction.

The forecast for imports of metal manufactures is based on their relation to U.S. construction employment. Projections for both series reflect the changing composition of U.S. population. Through the mid-1980's the population will be heavily endowed with people in their 20's and early 30's, people who will augment the demand for new housing construction as they form independent households. After this bulge in the population is adequately housed, the demand for new construction will fall back to a more traditional growth pattern.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = 2846.30 + \underset{(6.06)}{635.00}(\text{U.S. Employment in Contract Construction}) + \underset{(2.27)}{24.08}(\text{Time}) - \underset{(-1.03)}{64.45}(\text{Dummy, 1971})$$

$R^2 = .96$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

MACHINERY

Schedule A Codes: 71 - nonelectrical and 72 - electrical machinery

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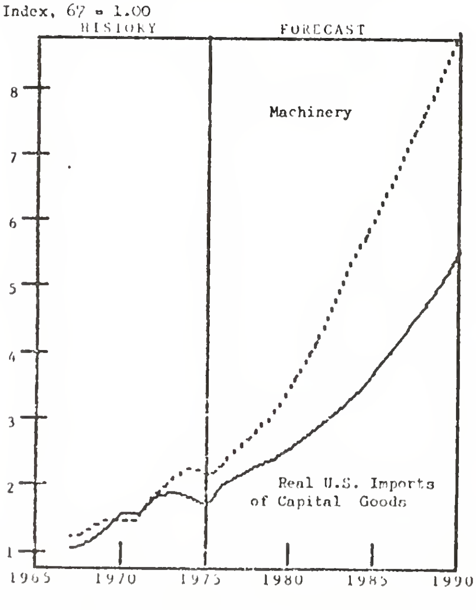
Composition: 70 percent 71.

Description: This group represented 1.1 percent of the non-oil waterborne import tonnage in 1975. The waterborne share of total machinery imports fell from 61 percent in 1967 to 51 percent in 1975 with the most severe losses in 1969 (-4 percent) and 1971 (-5 percent), years marred by extensive U.S. longshoremem strikes (Table A). Japan is the largest source of the waterborne share, accounting for 37 percent in 1975. Other major suppliers were: Germany (15 percent), England (10 percent), and Taiwan (5 percent). (See Table B.)

In the past, waterborne imports of machinery have paralleled real U.S. imports of capital goods, excluding autos, although



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	912.6	-	61
H#	1968	1015.3	11.3	59
I	1969	1202.5	18.4	55
S	1970	1439.4	19.7	57
T	1971	1445.0	0.4	52
O	1972	1665.7	15.3	53
R	1973	1726.5	3.7	52
Y	1974	1633.1	-5.4	50
	1975	1506.4	-7.8	51
F				
O				
R	1980	2336.8	9.2	-
E	1985	3354.7	7.5	-
C	1990	5044.4	8.5	-
A	1995	7411.5	8.0	-
S	2000	10889.3	8.0	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF MACHINERY
Percent Of Total Weight

	1971	1972	1973	1974	1975
Japan	41	43	40	34	37
Germany	14	13	14	17	15
England	12	10	10	8	10
China	3	5	6	6	5
Other	30	29	30	35	33
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

because of the declining waterborne share waterborne machinery imports have not kept pace.

Following a sharp recovery from the 1975 recession both series are projected to grow at an increasing rate. This pattern reflects a gradual restoration of business confidence as the economy returns to a steady growth path.

Forecast from 1980 to 1990 based on the following equation:

$$\text{Imports} = -3334.04 + \underset{(0.44)}{91.75}(\text{Real U.S. Imports of Capital Goods}) + \underset{(0.86)}{61.89}(\text{Time})$$

$R^2 = .76$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

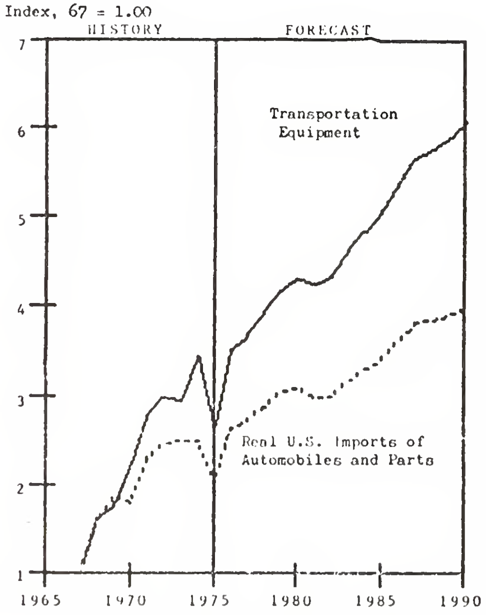
TRANSPORTATION EQUIPMENT

Schedule A Code: 73 - transport equipment which includes: 731 - railway vehicles and parts; 732 - road motor vehicles and parts; 733 - other vehicles; 734 - aircraft and spacecraft; 735 - boats.

Composition: 93 percent 732; 4 percent 731; 2 percent 733; and 1 percent 735.

Description: Transportation equipment accounted for 1.6 percent of the non-oil import tonnage in 1975. The waterborne share of total imports of transportation equipment has ranged from 38 percent in 1969 to 54 percent in 1974. Except for 1969 and 1975, waterborne share has shown a positive trend (Table A). Japan and Germany are the largest sources for the waterborne share, accounting for 55 percent and 20 percent, respectively, in 1975. Other major sources were Italy and England with 6 percent each (Table B).

In the past these imports have paralleled real U.S. imports of automobiles and parts. Waterborne imports of transportation



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	794.1	-	43
	1968	1268.1	59.7	43
	1969	1373.3	8.3	38
	1970	1714.7	24.9	44
	1971	2174.9	26.8	44
	1972	2348.7	8.0	49
	1973	2309.9	-1.7	50
	1974	2726.1	18.0	54
	1975	2059.2	-24.5	50
FORECAST	1980	3410.0	10.6	-
	1985	3987.9	3.2	-
	1990	4815.6	3.8	-
	1995	5722.7	3.5	-
	2000	6800.6	3.5	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305. FT 150. "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE
IMPORTS OF TRANSPORTATION EQUIPMENT
Percent Of Total Weight

	1971	1972	1973	1974	1975
Japan	44	50	47	52	55
Germany	34	30	29	25	20
England	7	6	5	4	6
Italy	3	4	4	5	6
Other	12	10	15	14	13
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

equipment, however, have grown faster due to the growth in waterborne share.

The forecast, based on the relation between the two series, calls for 10.6 percent growth to 1980 and 3-4 percent growth thereafter. A slowdown in the growth of U.S. driving population; rising domestic production of subcompacts; and increasing production of foreign cars in the U.S. are factors expected to dampen the long term growth of the two series.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = 4017.91 + \underset{(6.41)}{344.35}(\text{Real U.S. Imports of Automobiles and Parts})$$

$$+ \underset{(2.14)}{57.78}(\text{Time}) - \underset{(-2.08)}{286.35}(\text{Dummy, 1971})$$

$R^2 = .98$

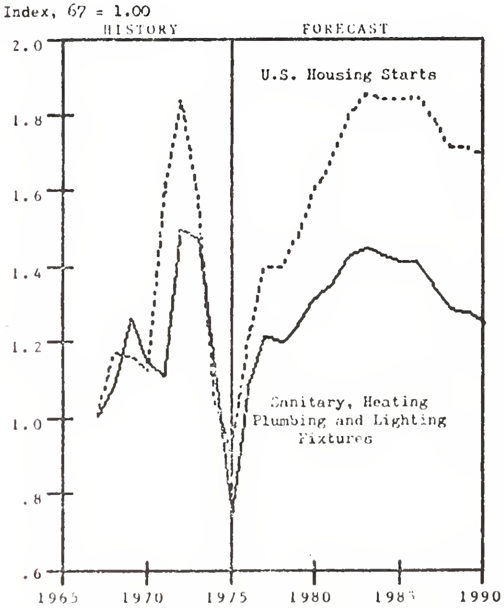
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

SANITARY, HEATING, PLUMBING AND LIGHTING FIXTURES

Schedule A Code: 812

Description: In 1975 this group amounted to only .02 percent of the non-oil waterborne import tonnage. The waterborne share of total imports of sanitary, heating, plumbing and lighting fixtures fell sharply from 92 percent in 1967 to 76 percent in 1975 (Table A). A 10 percent drop in 1971 coincided with severe dock strikes at Gulf, Atlantic and Pacific ports. Major sources for the waterborne share in 1975 were: Hong Kong (20 percent), Italy (17 percent), Spain (12 percent), Japan (9 percent), Germany (6 percent) and France (6 percent). (See Table B.) Since 1971 Japan and Hong Kong have lost some of their shares while each of the other major sources registered moderate gains.

The historical growth of these imports has paralleled that of U.S. housing starts. 1971 was an obvious exception due to the dock strikes.



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	29.6	-	92
	1968	31.9	8.1	90
	1969	37.2	16.4	86
	1970	33.8	-9.1	86
	1971	32.6	-3.6	76
	1972	44.1	35.3	77
	1973	43.2	-2.0	78
	1974	32.7	-24.2	77
	1975	22.0	-32.9	76
FORECAST	1980	38.8	12.1	-
	1985	41.6	1.4	-
	1990	36.5	-2.6	-
	1995	35.4	-0.6	-
	2000	34.4	-0.6	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF SANITARY, HEATING, PLUMBING AND LIGHTING FIXTURES

Percent Of Total Weight

	1971	1972	1973	1974	1975
Hong Kong	24	26	25	23	20
Italy	14	17	19	21	17
Japan	27	21	14	9	9
Spain	10	11	14	14	12
Germany	7	5	5	5	6
France	5	5	6	7	6
Other	13	15	17	21	30
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The forecast is based on the relationship between these waterborne imports and U.S. housing starts. Implicitly assumed in this forecast is a continuation of the declining waterborne share. The projection for both series reflects a bulge in housing demand as the post WW II baby boom generation establish independent households.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = 35.97 + \underset{(4.94)}{16.16}(\text{U.S. Housing Starts}) - \underset{(-0.83)}{.38}(\text{Time}) - \underset{(-2.25)}{9.07}(\text{Dummy, 1971})$$

$R^2 = .83$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

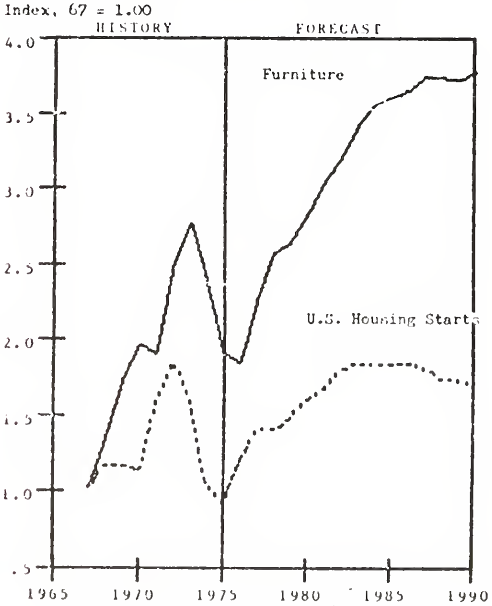
FURNITURE

Schedule A Code: 821

Description: These products accounted for only .1 percent of the total U.S. waterborne import volume in 1975. The waterborne share of total imports of furniture has fluctuated between 64 percent in 1967 and 42 percent in 1971 (Table A). Major sources for the waterborne share in 1975 were: Taiwan (23 percent), Yugoslavia (16 percent), Italy (7 percent), England (7 percent), Japan (4 percent), and Germany (3 percent). Japan's share has fallen sharply from 20 percent in 1971 while Taiwan's has grown by 7 percent over the same period (Table B).

The growth of these imports has paralleled that of U.S. housing starts with a one year lag.

Based on a projection of U.S. housing starts waterborne imports of furniture are expected to return to their 1973 peak tonnage by 1980. Growth from 1980 to 1990 will be somewhat slower as demographic changes (reduction in the rate of household formation) dampens the outlook for the U.S. housing industry.



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	66.0	-	64
	1968	89.2	35.2	55
	1969	113.2	26.9	49
	1970	129.4	14.3	49
	1971	124.4	-3.9	42
	1972	162.8	30.9	49
	1973	182.3	12.0	54
	1974	155.1	-14.9	53
	1975	124.2	-19.9	50
FORECAST	1980	185.8	8.4	-
	1985	236.4	4.9	-
	1990	248.8	1.0	-
	1995	287.9	3.0	-
	2000	333.1	3.0	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF FURNITURE

Percent Of Total Weight

	1971	1972	1973	1974	1975
China	16	16	21	21	23
Yugoslavia	16	15	15	15	16
Japan	20	19	12	6	4
Italy	8	8	7	7	7
Denmark	7	7	7	8	6
England	3	4	4	5	7
Germany	7	5	4	4	3
Other	23	26	30	34	34
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = -297.60 + \underset{(5.56)}{63.83}(\text{U.S. Housing Starts}-1) + \underset{(2.62)}{4.52}(\text{Time})$$

$R^2 = .93$

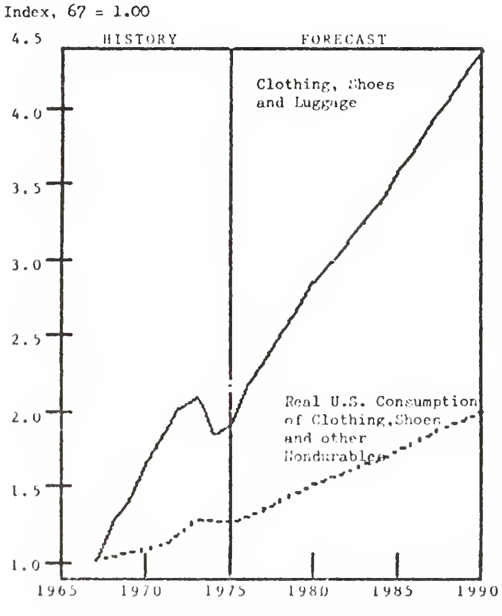
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

CLOTHING, SHOES AND LUGGAGE

Schedule A Codes: Includes: 831 - travel goods, handbags, and other personal goods; 841 - clothing and accessories; 842 - fur clothing; 851 - footwear.

Composition: 49 percent 851; 43 percent 841; and 8 percent 831.

Description: Nearly one-half of imports was footwear, and another 43 percent clothing and accessories. These commodities accounted for 0.4 percent of total non-oil import tonnage in 1975. Asian countries are the dominant sources of imports: China (31 percent), Korea (21 percent), Hong Kong (14 percent), Japan (5 percent), altogether accounted for 71 percent of U.S. imports of clothing, shoes and luggage. Japan's share fell from 24 percent in 1971 to mere 5 percent in 1975, but China and Korea's exports increased during the same period. There has been a slight downward trend in the waterborne share of total (all-mode) shipments to the U.S., but the nine-year



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	254.0	-	70
	1968	315.7	24.3	68
	1969	353.7	12.0	64
	1970	415.6	17.5	68
	1971	460.1	10.7	63
	1972	512.1	11.3	64
	1973	531.5	3.8	64
	1974	466.4	-12.2	62
	1975	481.6	3.3	57
FORECAST	1980	721.8	8.4	-
	1985	903.4	4.6	-
	1990	1110.0	4.2	-
	1995	1376.4	4.4	-
	2000	1706.9	4.4	-

* BASED ON DOLLAR VALUE.

# SOURCE: BUREAU OF THE CENSUS. SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF CLOTHING, SHOES AND LUGGAGE
Percent Of Total Weight

	1971	1972	1973	1974	1975
China	25	27	31	30	31
Hong Kong	17	16	14	14	14
Korea	14	16	17	20	21
Japan	24	18	11	7	5
Italy	8	8	8	8	8
Spain	4	4	4	6	6
Other	8	11	14	15	15
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

average is 65 percent waterborne. Highly competitive foreign goods successfully permeated the U.S. market and except in 1974, the import tonnage steadily increased during 1967-75 with an average growth rate of 10 percent per year. The decline in 1974 was due to a general decline in U.S. real consumption expenditures on clothing, shoes and other non-durable goods.

It is forecast by DRI that real U.S. consumption of clothing, shoes, and other non-durables will continue to grow in the future. In line with this forecast, the imports of these items will also grow at a steady rate of approximately 4.5 percent. Labor pressures in the U.S. apparel industry to curb imports may lead to some kind of voluntary or legal limits on import volume, and such arrangements could reduce apparel imports at least temporarily.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = -499.58 + \underset{(5.12)}{7.72}(\text{Real U.S. Consumption Expenditures--Clothing, Shoes and Other Nondurables})$$

$R^2 = .79$

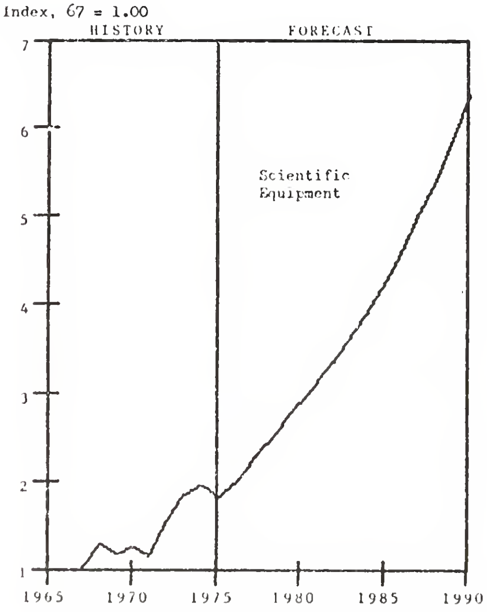
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

SCIENTIFIC EQUIPMENT

Schedule A Codes: 86 - professional, scientific and controlling equipment; photographic and optical goods, n.e.s.; watches and clocks which includes: 861 - scientific, medical, optical, measuring and controlling instruments and apparatus, n.e.s.; 862 - photographic film, plates, and paper--unexposed; 863 - motion picture and photographic film; and 864 - watches and clocks.

Composition: 47 percent 862; 36 percent 861; 16 percent 864; and 1 percent 863.

Description: Photographic materials, scientific, medical, optical, and other instruments accounted for .05 percent of total non-oil import tonnage in 1975. Japan leads the exporting countries with 35 percent share followed by Belgium and Luxembourg (25 percent), Germany (12 percent), and England (7 percent). On the average 42 percent of total import tonnage of scientific equipment was shipped by water. The waterborne share seems to drop lower than the average in the years when the volume of imports declined.



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	35.0	-	45
H#	1968	44.4	27.0	44
I	1969	40.0	-9.9	41
S	1970	43.9	9.9	45
T	1971	39.1	-11.0	38
O	1972	52.6	34.5	41
R	1973	64.2	22.2	41
Y	1974	68.0	5.9	42
	1975	62.1	-8.7	38
F				
O				
R	1980	100.6	10.1	-
E	1985	147.8	8.0	-
C	1990	222.2	8.5	-
A	1995	330.3	8.2	-
S	2000	490.9	8.2	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF SCIENTIFIC EQUIPMENT
Percent Of Total WEIGHT

	1971	1972	1973	1974	1975
Japan	44	46	37	36	35
Belgium and Luxembourg	9	13	18	21	25
Germany	24	17	16	16	12
England	7	7	6	7	7
Other	16	17	23	20	21
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The import volume declined in 1969 and 1971 when there were major U.S. dock strikes, and in 1975 when the economic recession set in the U.S. The overall growth rate was approximately 8 percent during the 1967-75 period, and the forecast calls for continued growth at the same rate of 8 percent or more.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = \underset{}{-159.07} + \underset{(2.98)}{88.59}(\text{U.S. Industrial Production}) + \underset{(1.62)}{1.56}(\text{Time}) \underset{(-1.28)}{-6.24}(\text{Dummy, 1969})$$

$R^2 = .92$

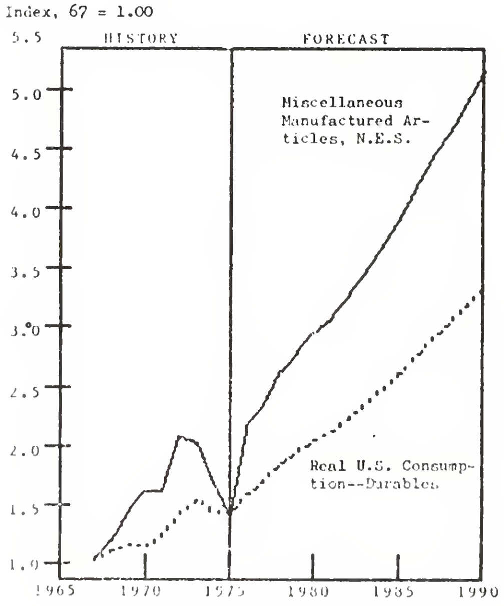
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

MISCELLANEOUS MANUFACTURED ARTICLES, N.E.S.

Schedule A Codes: 89 - miscellaneous manufactured articles, n.e.s. which includes: 891 - sound recorders, sound reproducers, musical instruments and parts thereof: 892 - printed matter; 893 - rubber and plastic manufactures, n.e.s.; 894 - baby carriages and strollers, wheelchairs, and parts thereof; 895 - office and stationary supplies; 896 - works of art; 897 - jewelry and related articles; 899 - manufactured articles, n.e.s.

Composition: 31 percent 894; 22 percent 893; 18 percent 891; 14 percent 899; 10 percent 892; 2 percent 895; 2 percent 896; and 1 percent 897.

Description: The import tonnage of baby carriages, strollers, rubber and plastic manufactures, sound recorders, musical instruments, and other miscellaneous manufactured articles (not elsewhere specified), constituted 0.4 percent to total non-oil imports in 1975. Three Asian countries, Japan (22 percent), Hong Kong (20 percent), and China (16 percent), took care of 58 percent of U.S. imports. Japan reduced its share from 40 percent in 1971 to 22 percent in 1975, and the loss is picked up by China. On the average, 64 percent of total imports



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	374.1	-	68
	1968	437.2	16.9	66
	1969	526.8	20.5	65
	1970	596.3	13.2	66
	1971	593.4	-0.5	62
	1972	764.4	28.8	67
	1973	737.7	-3.5	68
	1974	614.5	-16.7	56
	1975	507.5	-17.4	57
FORECAST	1980	1094.3	16.6	-
	1985	1457.7	5.9	-
	1990	1922.5	5.7	-
	1995	2548.1	5.8	-
	2000	3377.4	5.8	-

* BASED ON DOLLAR VALUE.

# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF MISCELLANEOUS MANUFACTURED ARTICLES
Percent of Total Weight

	1971	1972	1973	1974	1975
Japan	40	35	28	25	22
Hong Kong	24	25	23	20	20
China	9	12	16	17	16
England	8	8	8	9	9
Other	19	20	25	29	33
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

of these commodities were waterborne. The share seems to decline in the years in which negative annual growth rates were registered.

Between 1967 and 1972, the volume of imports more than doubled from 374,000 LT in 1967 to 764,000 LT in 1972. Even in 1971 when there were major dock strikes in the U.S., the volume declined only by .5 percent. The importation of these goods, however, suffered declines in three consecutive years coinciding with the generally unfavorable economic conditions prevailing in the U.S. at the time.

Inasmuch as a steady economic growth is assumed in the future, U.S. consumption on durables are forecast to grow at 5.1 percent. Barring, therefore, the high recovery rate in 1976 to the previous level of import volume, the forecast of waterborne imports of miscellaneous manufactured articles calls for nearly 6 percent annual growth rate in the future.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Imports} = -219.65 + \underset{(4.49)}{8.08}(\text{Real U.S. Consumption Expenditures--Durables})$$

$R^2 = .78$

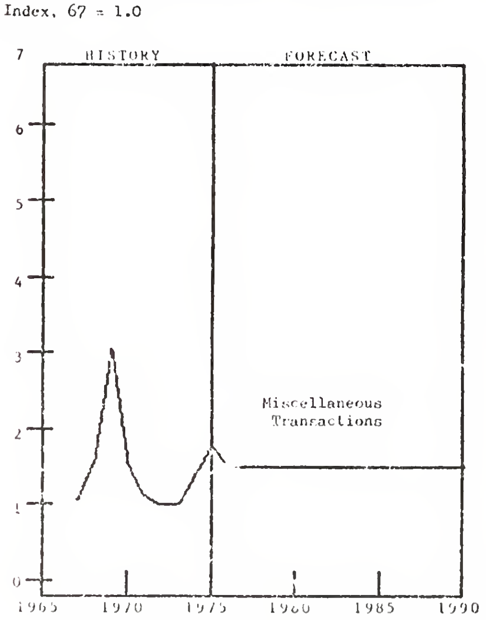
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

MISCELLANEOUS TRANSACTIONS

Schedule A Codes: 9 - Commodities and transactions not classified according to kind which includes: 931 - special transactions not classified according to kind; 941 - live animals, n.e.s.; 951 - arms and ammunition; 99 - entries less than 251 dollars.

Composition: 80 percent 931; 19 percent 990; and negligible amounts of the remaining.

Description: This group, 80 percent of which is classified, accounted for only .2 percent of the total U.S. waterborne import volume in 1975. The waterborne share of total imports of miscellaneous transactions has fluctuated between 26 percent in 1968 and 12 percent in 1974 (Table A). Major sources for the waterborne share in 1975 were: Taiwan (17 percent), Japan (11 percent), Hong Kong (8 percent), England (6 percent), The Netherlands (6 percent), Germany (5 percent), Korea (4 percent) and Canada (3 percent). The market shares have been extremely erratic from year to year. For instance Canada supplied 28 percent in 1971, but only 2 percent in 1972 (Table B).



UNITED STATES WATERBORNE IMPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	116.0	-	21
H#	1968	177.9	53.4	26
I	1969	353.7	98.B	19
S	1970	177.2	-49.9	19
T	1971	123.1	-30.6	17
O	1972	109.9	-10.7	16
R	1973	111.2	1.2	14
Y	1974	158.6	42.6	12
	1975	203.6	28.4	16
F				
O				
R	1980	170.2	-3.5	-
E	1985	170.2	0.	-
C	1990	170.2	0.	-
A	1995	170.2	0.	-
S	2000	170.2	0.	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 305, FT 150, "U.S. GENERAL IMPORTS".

Table B

MAJOR COUNTRIES OF ORIGIN FOR WATERBORNE IMPORTS OF MISCELLANEOUS TRANSACTIO

Percent Of Total Weight

	1971	1972	1973	1974	1975
China	-	6	1	7	17
Japan	5	12	10	13	11
Hong Kong	1	1	2	9	8
Germany	6	8	9	5	6
England	7	7	8	5	6
Netherlands	8	8	6	7	6
Belgium and Luxembourg	4	6	5	5	4
Canada	29	2	9	14	3
Other	40	50	50	35	39
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 305, U.S. General Imports.

The annual growth of these imports has been extremely erratic. For example, from 1968 to 1969 it was 99 percent, but from 1969 to 1970 it was -50 percent. Because of this volatility and because little is known about the commodities of this group, the forecast is the historical average, 170 thousand long tons.

Part IV

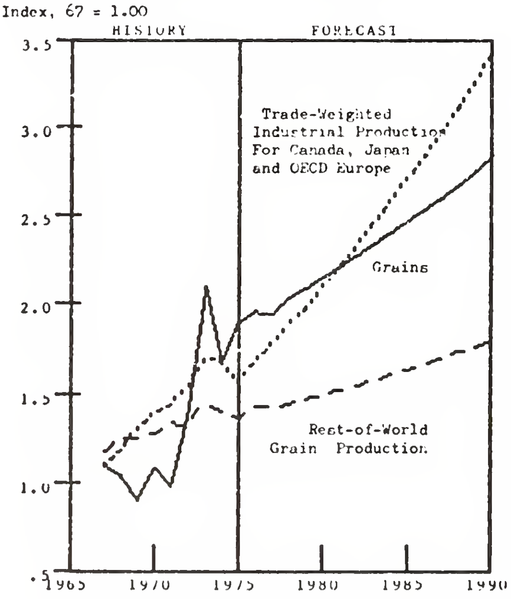
MICRO-MODEL EXPORTS

GRAINS

Schedule B Codes: 04 - grains which includes: 041 - wheat, unmilled; 042- cereals, unmilled; 046 - wheat flour, meal and groats; 047 - cereal flour, meal and groats; 048 - cereals and flour preparations.

Composition: 44 percent 04; 42 percent 041; 8 percent 045; 3 percent 042; 1 percent 043; 1 percent 046; 1 percent 048; and less than .5 percent o47.

Description: Grains, maily corn, maize, and wheat occupied 30 percent of the total U.S. waterborne export tonnage in 1975. Japan (14%), U.S.S.R. (10%), India (7%) have been the major importing countries (Table B). Practically all U.S. grain exports were shipped by vessel (Table A).



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	39960.7	-	98
H#	1968	37914.9	-5.1	98
I	1969	31897.4	-15.9	98
S	1970	39387.2	23.5	97
T	1971	35385.0	-10.2	98
O	1972	51204.8	44.7	98
R	1973	80356.6	56.9	98
Y	1974	62846.2	-21.8	97
	1975	71747.2	14.2	97
F				
O				
R	1980	82448.3	2.8	-
E	1985	95066.6	2.9	-
C	1990	109683.5	2.9	-
A	1995	126509.0	2.9	-
S	2000	145915.5	2.9	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION
FOR WATERBORNE GRAIN EXPORTS
Percent of Total Weight

	1971	1972	1973	1974	1975
Japan	17	16	17	18	14
USSR	1	13	17	5	10
India	5	1	4	4	7
Germany	4	4	4	5	7
Canada	5	3	6	5	4
Other	68	63	52	63	58
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports.

As the world's major exporting country, the U.S. export tonnage is closely affected by the rest-of-the-world grain supply and demand. Because of unpredictable weather conditions, world supply and especially the regional grain supply tends to fluctuate while the population growth pressure alone increases the food demand in the world. During the 1967-75 period grain exports nearly doubled from 40 million long tons in 1967 to 82 million tons in 1973 but fell to 72 million tons in 1975. Due to U.S. dock strikes, the import tonnages were down in 1969 and 1971; and down again in 1974. Japan has been a steady importer of U.S. wheat and feed grains. India imported a large quantity of wheat in 1975 and 1976. Russia did so in 1973 and 1975.

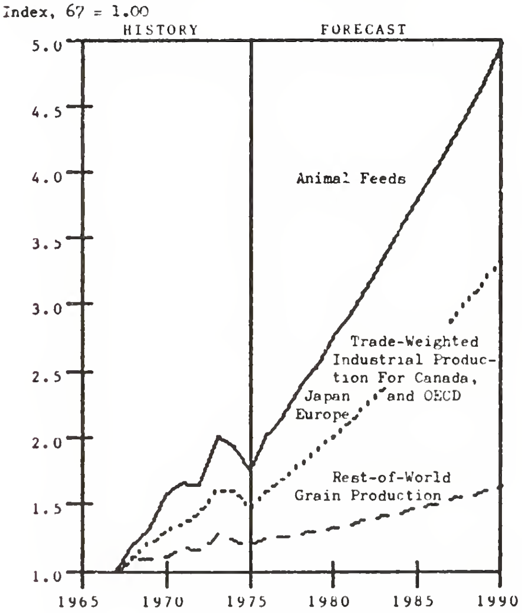
In spite of rapid growth in grain exports in recent years, the forecast calls for a moderate growth rate of 2.8 to 2.9 percent per year throughout the forecast horizon. Among the factors used for forecasting the grain exports is an estimate of production of grains in the rest of the world. It was assumed that the U.S. exports responds with a one-year lag to the shortfalls of the world production of grains.

Forecast from 1976 to 1990 based on the following equation:
Exports = 60726.30 + 33982.50 (Trade-weighted Industrial Production of Canada, Japan and OECD Europe) - 101.19 (Rest-of-World Grain Production - 1) +
(-.88)
29517.8(Dummy, 1973 through 1990) $R^2 = .88$
(3.34)
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

ANIMAL FEEDS

Schedule B Code: 081

Description: Feeding stuff for animals, consisting of, in major part, meat meal, including tankage, and fish meal unfit for human consumption, hay and fodder, and byproducts of cereal grains, constituted 2.4 percent of total U.S. waterborne exports in 1975. The major importing countries have been Holland (21 percent), Germany (21 percent), France (13 percent), Japan (8 Percent), and Belgium-Luxembourg (7 percent) (Table B). A large share or 90 to 93 percent of animal feeds exports were waterborne (Table A).



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	3267.1	-	90
H#	1968	3909.6	19.7	91
I	1969	4331.8	10.8	90
S	1970	5168.1	19.3	91
T	1971	5428.7	5.0	90
O	1972	5348.9	-1.5	92
R	1973	6564.9	22.7	93
Y	1974	6298.8	-4.1	91
	1975	5678.3	-9.9	90
F				
O				
R	1980	8923.4	9.5	-
E	1985	12336.4	6.7	-
C	1990	16197.5	5.6	-
A	1995	21822.6	6.1	-
S	2000	29401.3	6.1	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION
FOR WATERBORNE EXPORTS OF ANIMAL FEED
Percent of Total Weight

	1971	1972	1973	1974	1975
Holland	21	25	21	16	21
Germany	20	18	17	20	21
France	11	12	11	13	13
Japan	10	8	12	9	8
Belgium and Luxembourg	7	5	3	3	7
Other	31	32	36	39	30
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

During the last nine years (1967-75) annual changes in export volume parelleled fluctuations in the trade-weighted industrial production index for Japan, Canada, and OECD Europe; and, rest-of-world grain production. In spite of these fluctuations, the export volume grew on the average by 7 percent per year.

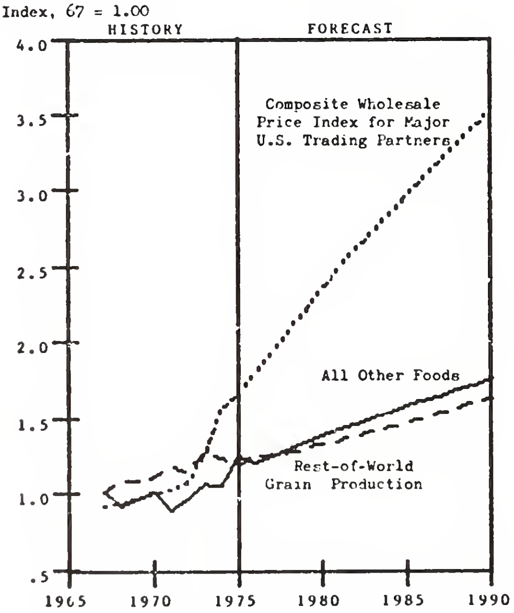
The forecast reveals that to 1980, the export volume will increase at the rate of 9.5 percent per year, but will slow to 6.7 percent from 1980 to 1985, and further to between 5.6 percent and 6 percent thereafter. Among the agricultural exports, animal feeds have the best growth potential, since the demand for meat of our major trading partners will continue to grow.

Forecast from 1976 to 1990 based on the following equation:
Exports = -2858.6 + 5909.80(Trade-Weighted Industrial Production for Canada, Japan, and OECD Europe) - 6.42 (Rest-of-World Grain Production-1) - 60.57
(-1.67) (-2.60)
(Dummy, 1973, 1974)
$R^2 = .97$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

OTHER FOODS

Schedule B Codes: Includes: 001 - live animals; 0 2 milk and cream; 023 - butter and anhydrous milk fat; 024 - cheese and curd; 025 - eggs; 031 - fish, fresh or simply preserved; 032-- fish in airtight containers; 051 - fresh fruit; 052 - dried fruit; 053 fruits and nuts, nes; 054 fresh vegetables; 055 - vegetables, preserved nes; 061 - sugar, syrups, molasses, and honey; 062 - confectionary sugar; 071 - coffee; 072 - cocoa; 073 - chocolate; 074 - tea and mate; 075 - spices; 091 - margarine and edible fats; 099 - food preparations nec; 011 - meat, fresh, chilled or frozen; 012 - meat, dried, salted or smoked; and 013 - meat in containers.

Composition: 35 percent 051; 13 percent 054; 12 percent 011; 9 percent 053; 6 percent 061; 6 percent 099; 4 percent 052; 2 percent 055; 2 percent 091; 3 percent 022; 3 percent 031; 1 percent 012; 1 percent 032; and neglible amounts for the remaining products.



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	2025.7	-	66
H#	1968	1857.3	-8.3	65
I	1969	1942.9	4.6	63
S	1970	2022.7	4.1	64
T	1971	1802.2	-10.9	60
O	1972	1935.6	7.4	59
R	1973	2163.9	11.8	60
Y	1974	2119.2	-2.1	58
	1975	2512.0	18.5	61
F				
O				
R	1980	2791.6	2.1	-
E	1985	3171.8	2.6	-
C	1990	3534.1	2.2	-
A	1995	3976.5	2.4	-
S	2000	4474.1	2.4	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705. FT 450. "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF OTHER FOODS

Percent Of Total Weight

	1971	1972	1973	1974	1975
Japan	13	19	26	23	22
England	16	11	9	8	7
Germany	8	8	8	6	7
Holland	6	7	7	6	8
France	6	7	7	7	8
Belgium and Luxembourg	2	2	2	2	3
Other	49	46	41	48	45
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports.

Description: In 1975 this group accounted for 1 percent of the total U.S. waterborne export volume. The waterborne share of total exports of other foods has ranged from 66 percent in 1967 to 58 percent in 1974 with a slight negative trend from 1967 to 1975 (Table A). Major countries of destination for the waterborne share in 1975 were: Japan (22 percent), Holland (8 percent), France (8 percent), England (7 percent), Germany (7 per cent), and Belgium and Luxembourg (3 percent). Japan has increased its share while England's has declined (Table B).

The major factors driving these exports appear to be U.S. price competitiveness and rest-of-world grain production.

Waterborne exports of other foods are expected to grow from 2.5 million long tons in 1975 to 4.5 million long tons by 2000, an implied annual growth rate of 2.3 percent. This is much slower than the 9.1 percent annual growth from 1973 to 1975. An expected recovery in rest-of-world grain production is responsible for this slowdown.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 1319.50 + \underset{(3.35)}{629.15}(\text{Composite wholesale Price Index for Major U.S. Trading Partners}) - \underset{(-.04)}{.065}(\text{Rest-of-World Grain Production})$$

$R^2 = .69$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

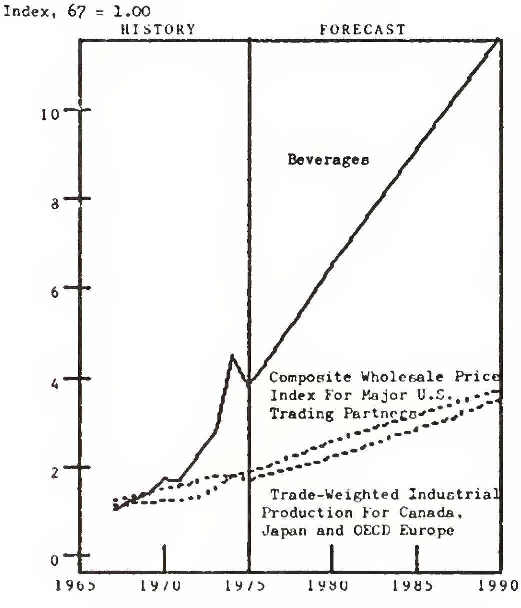
BEVERAGES

Schedule B Codes: 11 - Beverages which includes: 111 - non-alcoholic beverages and 112 - alcoholic beverages.

Composition: 76 percent alcoholic.

Description: Consisting of in major part distilled alcoholic beverages and ale, beer, and wine, this group accounted for .04 percent of total waterborne exports in 1975. The chief importers of U.S. beverages in 1975 were Germany with 15 percent, Bahamas (9 percent), Hong Kong (7 percent), Bermuda (5 percent), and Sweden (5 percent). (See Table B.)

The nine-year (1967-75 history shows the waterborne export tonnage increased from a mere 23,500 LT in 1967 to as high as



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	23.5	-	73
	1968	28.0	19.4	74
	1969	31.6	12.7	74
	1970	41.0	29.8	81
	1971	39.8	-3.1	79
	1972	51.5	29.4	81
	1973	64.2	24.7	82
	1974	105.3	64.1	88
	1975	89.0	-15.5	84
FORECAST	1980	152.7	11.4	-
	1985	214.0	7.0	-
	1990	276.3	5.2	-
	1995	371.6	6.1	-
	2000	499.9	6.1	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE BEVERAGE EXPORTS

Percent of Total Weight

	1971	1972	1973	1974	1975
Germany	19	19	22	27	15
Bahamas	17	17	16	8	9
Hong Kong	3	2	4	8	7
Bermuda	6	4	3	4	5
Sweden	3	2	2	3	5
Other	52	56	53	50	59
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports.

105,300 LT in 1974, but declined to 89,000 LT in 1975 (Table A). This represented nearly 20 percent average annual growth. Declines were registered only in 1971 and 1975. The driving factors behind this growth seem to be foreign demand as well as U.S. price competitiveness.

The export volume is expected to recover from the 1975 low and surpass the 1974 peak by 1977. The forecast growth rate for the period, 1975-2000, is 7.1 percent per year.

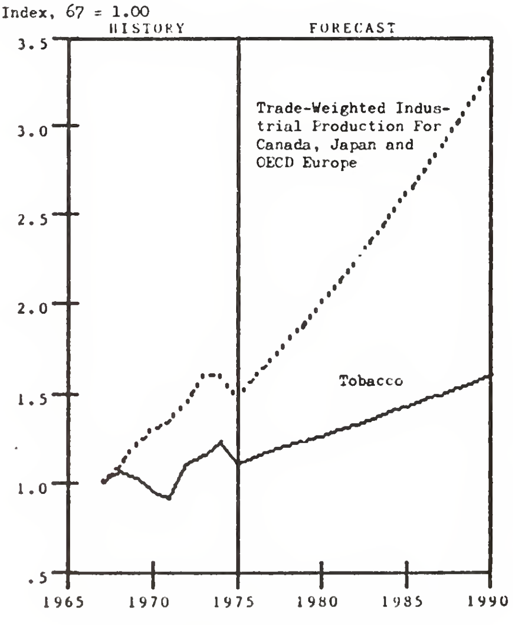
Forecast from 1976 to 1990 based on the following equation:
Exports = −71.67 + 66.71(Composite Wholesale Price Index of Major U.S.
(14.19)
Trading Partners) + 34.03(Trade-Weighted Industrial Production for Canada,
(5.33)
Japan and OECD Europe) + 19.23(Dummy, 1974)
(6.62)
$R^2 = .99$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

TOBACCO

Schedule B Codes: 12 - Tobacco which includes: 121 - unmanufactured tobacco and 122 - tobacco manufactures.

Composition: 84 percent 121.

Description: The United States is the world's leading tobacco exporter and the third largest importer. In 1975, the export of tobacco (burley leaf, flue cured and other unmanufactured tobacco and tobacco products) constituted .15 percent of total waterborne export tonnage. In 1960-64, about 30 percent of the U.S. tobacco crop was exported. Recently our exports have represented about 35 percent of the U.S. tobacco crop and about 25 percent of world tobacco exports. In terms of tonnage, the U.S. exports approximately 2 1/2 times more than it imports. Practically all (97-98 percent) of these exports were waterborne (Table A).



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	336.7	-	98
H#	1968	358.3	6.4	98
I	1969	343.3	-4.2	98
S	1970	318.5	-7.2	98
T	1971	303.2	-4.8	97
O	1972	371.5	22.6	97
R	1973	384.9	3.6	97
Y	1974	414.5	7.7	97
	1975	369.3	-10.9	98
F				
O				
R	1980	422.7	2.7	-
E	1985	477.7	2.5	-
C	1990	538.9	2.4	-
A	1995	608.5	2.5	-
S	2000	687.1	2.5	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE TOBACCO EXPORTS
Percent of Total Weight

	1971	1972	1973	1974	1975
Germany	17	14	13	12	13
Japan	4	12	11	15	13
England	16	16	16	12	12
Switzerland	5	5	5	4	4
Italy	4	4	4	3	4
Other	54	49	51	54	54
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

Japan (13 percent share) has been emerging as the leading importer of the U.S. tobacco exceeding imports by West Germany (13 percent), and the United Kingdom (12 percent) whose share has declined in recent years. (Table B). Japan raised its retail cigarette prices in December 1975 which temporarily slowed their cigarette consumption, but did not have a long-term effect. Manufacturers in European Community (EC) countries have preferential access to large supplies from the EC's former overseas territories as well as those of many LDCs. Accordingly, overall EC takings were down slightly in the recent past.

In addition to regular sales, CCC credit sales (the Commodity Credit Corporation provides credit on commercial exports), and limited volume of P.L. 480 shipments affect trade volumes annually.

During 1967-75, the tonnage of tobacco exports increased only by an annual average of 2 percent per year. The U.S. dock strikes (1969 and 1971); the Public Health Smoking Act of 1969, and generally higher prices hampered the growth.

The forecast calls for a moderate growth of 2.4-2.7 percent per year throughout the forecast horizon.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 111.37 + \underset{(.49)}{72.50}(\text{Trade-Weighted Industrial Production for Canada, Japan, and OECD Europe}) + \underset{(.18)}{2.08}\,(\text{Time})$$

$R^2 = .36$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

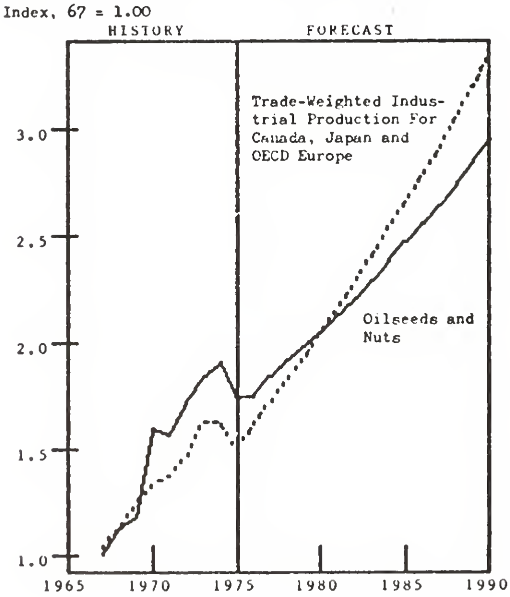
OILSEEDS AND NUTS

Schedule B Code: 221

Description: The exports of oilseeds which include soybeans accounted for 5.3 percent of total waterborne export tonnage in 1975. Practically all (97 to 98 percent) of this category are shipped by water (Table A). The major importing countries are: Japan (22 percent), Holland (22 percent), Germany (10 percent), Spain (9 percent), and Taiwan (7 percent) (Table B).

The exports of oilseeds increased fast in the early seventies due to the worldwide demand for animal feeds. The export volume grew at an annual average rate of 7 percent, or from 7.4 million long tons (LT) in 1967 to 14.0 million LT in 1974, and fell to 12.8 million LT in 1975.

Although the foreign demand for oilseeds is expected to persist, the already established high prices, as well as high domestic



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	7369.3	-	98
H#	1968	8282.9	12.4	98
I	1969	8650.5	4.4	98
S	1970	11724.7	35.5	97
T	1971	11503.4	-1.9	97
O	1972	12649.8	10.0	98
R	1973	13531.5	7.0	97
Y	1974	14047.0	3.8	97
	1975	12799.0	-8.9	98
F				
O				
R	1980	15067.6	3.3	-
E	1985	18205.2	3.9	-
C	1990	21741.8	3.6	-
A	1995	26116.9	3.7	-
S	2000	31372.4	3.7	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION
FOR WATERBORNE EXPORTS OF OILSEEDS AND NUTS
Percent of Total Weight

	1971	1972	1973	1974	1975
Japan	24	24	24	20	22
Holland	14	17	17	18	22
Germany	13	14	13	14	10
Spain	9	10	6	9	9
Taiwan	5	5	4	3	7
Other	35	30	36	36	30
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

demand, will probably keep the future rates of growth smaller than those of the past. 3 to 4 percent annual growth is expected over the forecast horizon.

Export tonnage of oilseeds and nuts is correlated to the trade weighted industrial production index for Canada, Japan, and OECD Europe lagged by one year. The latter variable represents a proxy for the growing economies of major U.S. trading partners and accordingly the demand for oilseeds. The industrial production index is forecast to grow from 1.47 to 1967 to 3.32 by 1990.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 5762.86 + \underset{(3.41)}{4662.71}(\text{Trade-Weighted Industrial Production for Canada, Japan, and OECD Europe-1}) - \underset{(-3.05)}{2359.67}(\text{Dummy, 1967-69})$$

$R^2 = .95$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

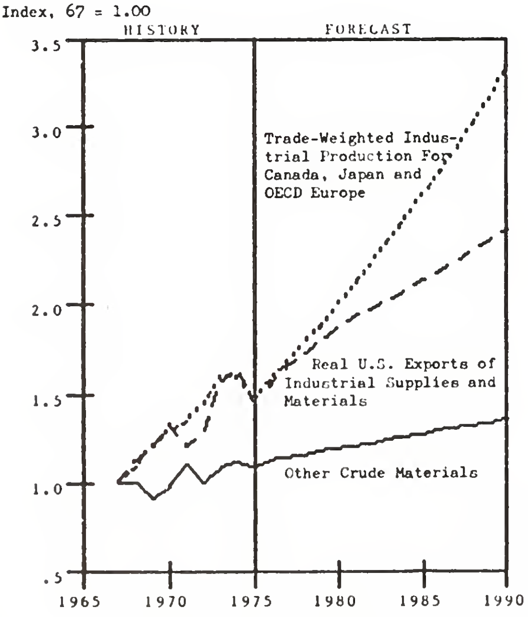
OTHER CRUDE MATERIALS

Schedule B Codes: Includes: 211 - hides and skins; 212 - fur skins; 231 - crude rubber; 291 - animal materials, nes; 292 - vegetable materials, nes.

Composition: 62 percent 211; 24 percent 231; 11 percent 292; 3 percent 291; and negligible amounts of 212.

Description: In 1975 other crude materials, mostly hides and skins, accounted for only .3 percent of the total U.S. waterborne export volume. The waterborne share of total exports of other crude materials has ranged from 75 percent in 1967 to 67 percent in 1975 with a declining trend. (Table A). The largest market for the waterborne share in 1975 was Japan with 29 percent. Other major countries of destination were: Korea (8 percent), Holland (7 percent), Romania (4 percent), Brazil and Taiwan (3 percent each). (Table B).

Except for 1969 and 1971 the growth of these exports has paralleled that of real U.S. exports of industrial supplies



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	681.8	-	75
	1968	679.7	-0.3	73
	1969	617.3	-9.2	68
	1970	664.6	7.7	70
	1971	744.8	12.1	68
	1972	677.5	-9.0	71
	1973	735.6	8.6	71
	1974	759.8	3.3	69
	1975	741.1	-2.5	67
FORECAST	1980	808.5	1.8	-
	1985	864.2	1.3	-
	1990	918.8	1.2	-
	1995	979.5	1.3	-
	2000	1044.2	1.3	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF OTHER CRUDE MATERIALS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Japan	24	31	31	29	29
Holland	5	5	7	10	7
Korea	1	1	4	5	8
Romania	2	4	3	5	4
Brazil	2	3	4	4	3
Taiwan	1	2	3	3	3
Other	65	54	48	44	46
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports.

and materials and industrial production in our major trading partners. The sharp decline in 1969 was probably due to severe dock strikes at Gulf and Atlantic ports while the boom in 1971 was the result of an embargo on exports of hides and skins by Argentina, the world's second largest exporter.

The forecast, based on projections of the two variables mentioned above, calls for waterborne exports of other crude materials to grow from 741 thousand long tons in 1975 to 1044 long tons by 2000. The implied annual growth rate is only 1.4 percent. This sluggishness reflects to some extent the declining waterborne share.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = -188.79 - \underset{(-0.06)}{15.98}(\text{Trade-Weighted Industrial Production for Canada, Japan and OECD Europe}) + \underset{(0.04)}{0.88}(\text{Real U.S. Exports of Industrial Supplies and Materials}) + \underset{(0.82)}{12.66}(\text{Time})$$

$R^2 = .49$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

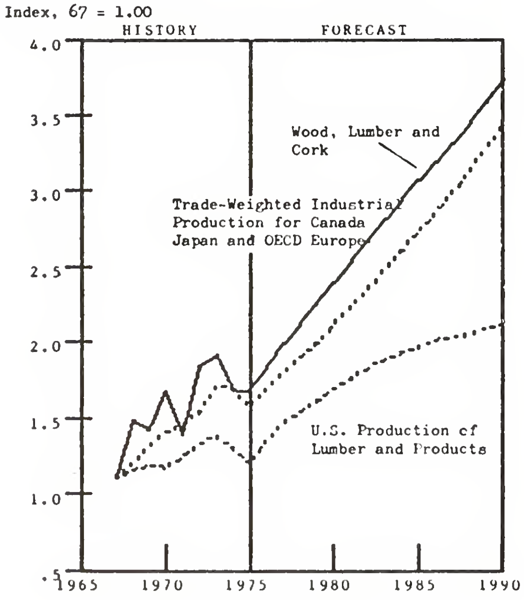
WOOD, LUMBER AND CORK

Schedule B Codes: 24 - wood, lumber and cork which includes: 241 - fuel wood, charcoal, and waste; 242 - wood in the rough; 243 - wood shaped or simply worked; and 244 - work.

Composition: 86 percent 242; 16 percent 243; and negligible amounts of 241 and 244.

Description: This group represented 4.8 percent of total U.S. waterborne exports in 1975. 78 to 86 percent of all exports of wood, lumber and cork were carried by vessel from 1967 to 1975. The largest recipient of the waterborne share was Japan with 87 percent in 1975. Other importers were: Canada (2 percent), Italy (2 percent), and Germany and Australia (1 percent each).

Historical growth was positive in half the years shown. Declines in 1969 and 1971 coincided with major U.S. dock strikes which hampered operations in Gulf and Atlantic ports in 1969; and Gulf, Atlantic, and Pacific ports in 1971.



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	7320.2	-	78
H#	1968	10041.1	37.2	83
I	1969	9630.5	-4.1	83
S	1970	11523.8	19.7	86
T	1971	9450.4	-18.0	82
O	1972	12670.7	34.1	83
R	1973	13291.9	4.9	86
Y	1974	11564.8	-13.0	83
	1975	11495.0	-0.6	83
F				
O				
R	1980	16711.0	7.8	-
E	1985	21610.1	5.3	-
C	1990	26490.7	4.2	-
A	1995	33353.3	4.7	-
S	2000	41993.7	4.7	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION
FOR WATERBORNE EXPORTS OF WOOD, LUMBER, AND CORK
Percent of Total Weight

	1971	1972	1973	1974	1975
Japan	87	86	86	85	87
Canada	2	6	2	2	2
Italy	2	2	3	2	2
Germany	1	1	2	1	1
Australia	1	1	2	2	1
Other	7	4	5	8	7
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

Exports fell again sharply in 1974. The major drop in 1974 was in shipments to Japan as the Japanese agreed voluntarily to slow imports. In 1974 and 1975 Japanese markets, particularly in construction, also acted to hold down imports.

The forecast, based on projections of industrial production abroad as well as U.S. production of lumber and products, calls for exports to grow from 11.5 million long tons in 1975 to nearly 42 million long tons by 2000, or an average annual growth rate of 5.3 percent.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 1547.60 - \underset{(-.11)}{69.18}(\text{Time}) + \underset{(.38)}{5087.22}(\text{U.S. Industrial Production--Lumber and Products}) + \underset{(.53)}{6303.76}(\text{Trade-Weighted Industrial Production for Canada, Japan and OECD Europe})$$

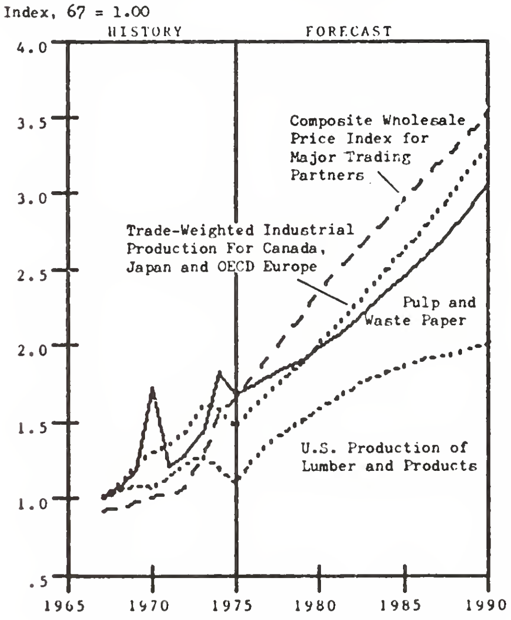
$R^2 = .72$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

PULPS AND WASTE PAPER

Schedule B code: 251

Description: In 1975 these exports represented 1.2 percent of total U.S. waterborne exports. The waterborne share of total exports of pulps and waste paper has ranged from 94 percent in 1967 to 86 percent in 1974 with a slight downward trend (Table A). The major market for these exports has been Japan, accounting for 17 percent in 1975 (Table B). Other major buyers are Italy (10 percent), England (10 percent), Germany (9 percent), and France (7 percent). Several studies have predicted an increasing reliance of these and other countries on supplies from Canada, U.S. and the USSR.*



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	1686.8	-	94
H#	1968	1819.4	7.9	93
I	1969	1989.9	9.4	92
S	1970	2888.3	45.1	91
T	1971	2053.1	-28.9	89
O	1972	2151.7	4.8	90
R	1973	2389.0	11.0	88
Y	1974	3087.8	29.2	86
	1975	2825.6	-8.5	89
F				
O				
R	1980	3356.1	3.5	-
E	1985	4144.2	4.3	-
C	1990	5151.7	4.4	-
A	1995	6382.8	4.4	-
S	2000	7908.0	4.4	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

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* United Nations Economics and Social Council, Economic Commission for Europe Timer Committee, TIM/Working Paper No. 173/Add. 1, 19 p. July 12, 1972; and Japan Ministry of Agriculture and Forestry, "Basic Plan relating to forest resources and long term forecast relating to the demand for and supply of important forest proudcts, (Cabinet Decision) February 1973.

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF PULPS AND WASTE PAPER

Percent of Total Weight

	1971	1972	1973	1974	1975
Japan	17	19	22	23	17
Italy	9	10	10	11	10
England	12	11	9	10	10
Germany	9	8	9	8	9
France	7	6	6	5	7
Other	46	46	44	43	47
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

Waterborne exports of pulps and waste paper have grown in 6 of the 8 years shown. Nearly all of the growth has consisted of shipments from Pacific ports to Japan. Recently shipments have increased from U.S. southern ports to Western Europe. Prospects for these trades are excellent.

The forecast, based on projections of production in our major trading partners as well as U.S. production of lumber and products, calls for steady growth from 3.5 to 4.4 percent per year over the forecast horizon.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 5361.47 + \underset{(3.56)}{2090.20}(\text{Trade Weighted Industrial Production for Canada, Japan and OECD Europe}) - \underset{(-4.24)}{80.02}(\text{Time}) - \underset{(-.41)}{368.78}(\text{U.S. Industrial Production--Lumber and Products}) + \underset{(10.74)}{794.87}(\text{Dummy, 1970, 1974-90})$$

$R^2 = .99$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

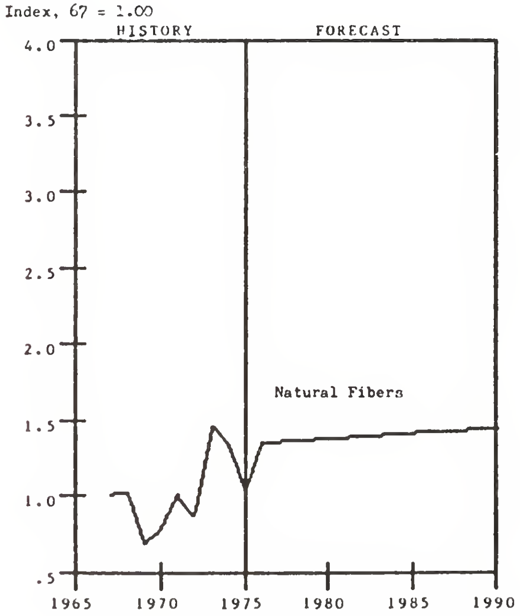
NATURAL FIBERS

Schedule B Codes: Includes: 261 - raw silk; 262 - wool and other animal hair; 263 - cotton; 264 - jute; 265 vegetable fibers, nes; 267 - textile waste.

Composition: 80 percent 263; 18 percent 267; 2 percent 262; and negligible amounts of the remaining products.

Description: In 1975 natural fibers were .5 percent of the total U.S. waterborne export volume. The waterborne share of total exports of natural fibers has consistently been over 90 percent ranging from 96 percent in 1968 to 91 percent in 1970, 71, 72. Major markets for the waterborne share in 1975 were: Japan (18 percent), Korea (17 percent), and Taiwan (12 percent).

These exports showed positive growth in half the years from 1967 to 1975. The largest decline (-31.9 percent) came in 1969 due to short supplies and sharply rising prices for cotton.



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	1091.9	-	92
H#	1968	1108.6	1.5	96
I	1969	754.6	-31.9	92
S	1970	849.6	12.6	91
T	1971	1097.7	29.2	91
O	1972	953.7	-13.1	91
R	1973	1581.3	65.8	93
Y	1974	1461.5	-7.6	94
	1975	1126.5	-22.9	95
F				
O				
R	1980	1498.3	5.9	-
E	1985	1536.1	0.5	-
C	1990	1574.9	0.5	-
A	1995	1614.7	0.5	-
S	2000	1655.5	0.5	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE
EXPORTS OF NATURAL FIBERS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Japan	21	20	23	24	18
Korea	11	11	10	10	17
Taiwan	9	7	8	5	12
Other	59	62	59	61	53
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports.

These conditions recurred again in 1972 resulting in a 13.1 percent drop in waterborne export volume. Waterborne exports of natural fibers fell again in 1974 and 1975 coinciding with falling production abroad.

The forecast, based on a non-linear time trend, calls for waterborne exports of natural fibers to grow from a depression low 1126 thousand long tons in 1975 to 1655 thousand long tons by 2000 or an annual growth rate of 1.5 percent. If, however, the 25-year rate is calculated using the 1973 peak volume as the base, the rate falls to only .2 percent per year. This forecast appears reasonable given the fact that natural fibers have been losing world markets to manmade fibers. However, an energy crisis or sharply rising oil costs could improve the outlook for natural fibers since petrochemicals are a major input in the production of manmade fibers.

Forecast from 1976 to 1990 based on the following equation:
$\text{Log}_{10}\ \text{Exports} = \text{Log}_{10}(1461.40) + \text{Log}_{10}(1.005)(\text{Time} - 75)$

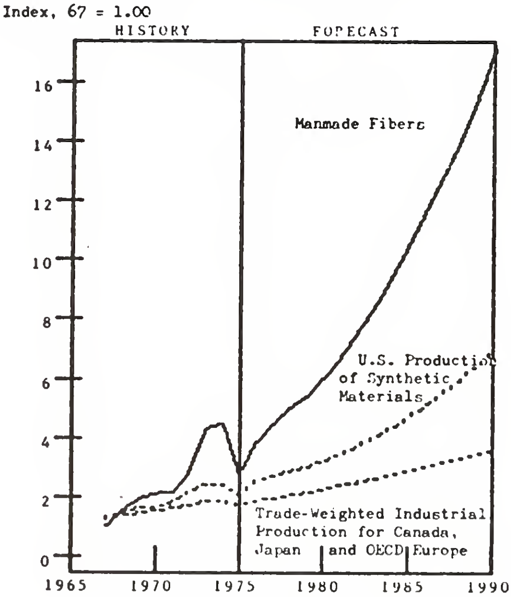
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

MANMADE FIBERS

Schedule B Code: 266

Description: This group accounted for .05 percent of total U.S. waterborne exports in 1975. The waterborne share of total exports of manmade fibers has ranged from 72 percent in 1975 to 82 percent the previous year with no discernible trend over the historical period, 1967-75 (Table A). Belgium and Luxembourg was the largest market for these exports with 16 percent in 1975 (Table B). Other major markets were: Hong Kong (9 percent), Italy (8 percent), Germany (4 percent), and Ecuador (4 percent).

Growth of these exports was positive in 7 of the 8 years shown and in four years, 1968-69 and 1972-73, it was exceptional. The growth over these years reflected a displacement of cotton by manmade fibers in world markets.



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	40.5	-	75
HISTORY #	1968	61.2	51.1	78
	1969	77.3	26.4	76
	1970	82.5	6.7	75
	1971	86.5	4.8	77
	1972	111.6	29.1	76
	1973	174.7	56.4	80
	1974	178.7	2.3	82
	1975	109.2	-38.9	72
FORECAST	1980	241.9	17.2	-
	1985	420.9	11.7	-
	1990	691.5	10.4	-
	1995	1169.1	11.1	-
	2000	1976.5	11.1	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION
FOR WATERBORNE EXPORTS OF MANMADE FIBERS
Percent of Total Weight

	1971	1972	1973	1974	1975
Belgium and Luxembourg	17	16	11	17	16
Italy	4	8	7	7	8
Hong Kong	6	5	4	4	9
Germany	7	10	12	9	4
Ecuador	2	2	1	1	4
Other	64	41	35	62	59
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

High cotton prices and a short supply situation in 1967 precipitated shifts to manmade fibers in 1968-69. Although supplies proved adequate and prices fell in subsequent years, cotton did not recover the markets it had lost and in 1972-73 the situation was repeated.

The forecast, based on projections of production in our major trading partners as well as U.S. production of synthetics, calls for continued strong growth. Exports are expected to rise from 109 thousand long tons in 1975 to nearly 2 million long tons by 2000. A major caveat in this forecast is the assumption of uninterrupted supplies and relative price stability for petrochemicals, a major input in the production of manmade fibers. A reccurence of a situation like the oil embargo and quadrupling of oil prices in 1973-74 could shift markets from manmade to natural fibers.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 340.27 + \underset{(0.85)}{121.99}(\text{Trade-Weighted Industrial Production for Canada, Japan, and OECD Europe}) - \underset{(-1.54)}{7.85}(\text{Time}) + \underset{(1.51)}{97.06}(\text{U.S. Industrial Production--Synthetic Materials})$$

$R^2 = .93$

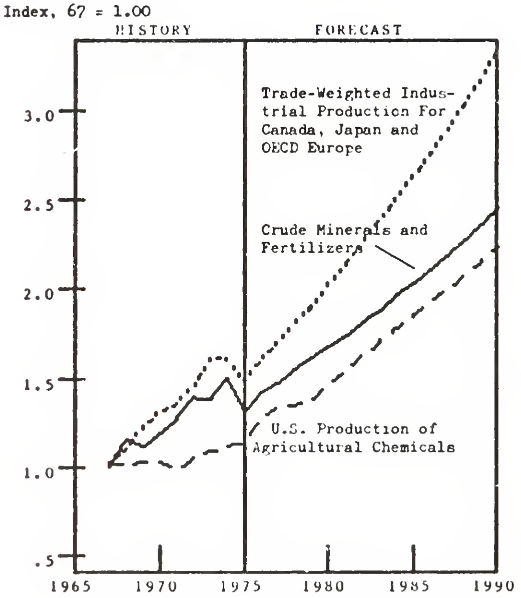
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

CRUDE FERTILIZERS AND MINERALS

Schedule B Codes: 27 - Crude fertilizers and minerals which includes: 271 - crude fertilizers; 273 - stone, sand and gravel; 274 - sulfur and crude iron pyrites; 276 - crude minerals, n.e.s..

Composition: 55 percent 271; 23 percent 273; 14 percent 276; 7 percent 274; and 1 percent 275.

Description: This group accounted for 7.3 percent of total U.S. waterborne exports in 1975, down from 8.4 percent in 1974. The waterborne share of total exports of crude fertilizers and minerals increased sharply from 70 percent in 1973 to 79 percent in 1975 (Table A). Canada was the largest market for the waterborne share, accounting for 34 percent in 1975. Other major markets were: Japan (12 percent), Holland (9 percent), Belgium and Luxembourg (6 percent) and Mexico (5 percent) (Table B).



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	13290.5	-	72
H#	1968	15278.2	15.0	73
I	1969	14718.2	-3.7	72
S	1970	15764.7	7.1	72
T	1971	16842.0	6.8	71
O	1972	18541.5	10.1	70
R	1973	18271.4	-1.5	70
Y	1974	19887.7	8.8	77
	1975	17475.2	-12.1	79
F				
O				
R	1980	22268.3	5.0	-
E	1985	27073.2	4.0	-
C	1990	32610.0	3.8	-
A	1995	39462.3	3.9	-
S	2000	47754.6	3.9	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION
FOR WATERBORNE EXPORTS OF CRUDE FERTILIZERS AND MINERALS
Percent of Total Weight

	1971	1972	1973	1974	1975
Canada	24	24	26	29	34
Japan	14	13	13	13	12
Holland	9	9	8	9	9
Belgium & Luxembourg	6	7	8	9	6
Mexico	5	4	5	4	5
Other	42	43	40	36	34
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

The historical growth of these exports was positive in 5 of the 8 years shown. Low prices and abundant supplies in 1974 combined with favorable economic conditions abroad to produce a nine year peak of 19.9 million long tons. The situation turned around in 1975; higher prices and worldwide recession resulted in a -12 percent decline from the year before.

The forecast, based on projections of foreign industrial production and U.S. production of agricultural chemicals (competes with foreign markets for crude fertilizer materials), calls for positive growth, but at diminishing rates. This seems reasonable given recent trends toward fertilizer self-sufficiency in the developing countries.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 815.59 + \underset{(1.89)}{8633.45}(\text{Trade-Weighted Industrial Production for Canada, Japan and OECD Europe}) + \underset{(0.22)}{98.29}(\text{Time}) - \underset{(-0.22)}{2566.56}(\text{U.S. Industrial Production--Agricultural Chemicals})$$

$R^2 = .81$

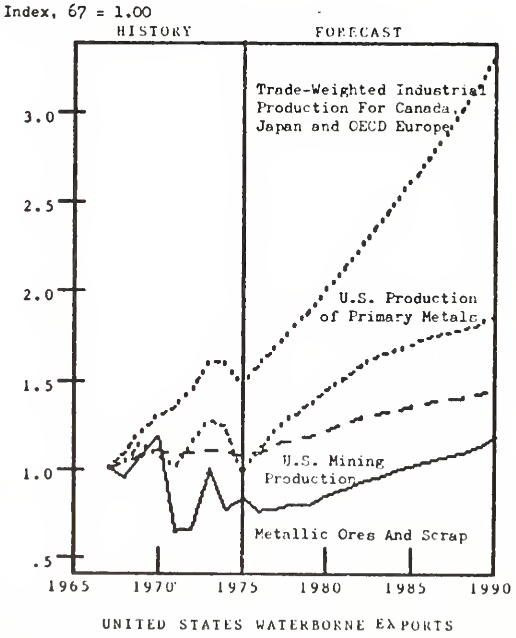
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

METALLIC ORES AND SCRAP

Schedule B Codes: 28 - metallic ores and scrap which includes: 281 - iron ores and concentrates; 282 - iron and steel scrap; 283 - nonferrous ores and concentrates; 284 - nonferrous metal scrap; 285 - platinum; 286 - uranium and thorium ores.

Composition: 67 percent 282; 25 percent 281; 5 percent 283; 3 percent 328; and negligible amounts of the remaining commodities.

Description: This group is principally iron ore and iron and steel scrap which are used interchangeably in steel production. (See above). In 1975 the group as a whole accounted for 4.1 percent of total U.S. waterborne exports, down from the historical high of 6.5 percent in 1970. The waterborne share of total exports of metallic ores and scrap ranged from 89 percent in 1970 to 82 percent in 1968, 71, 72, and 75 (Table A). The major countries of destination for the waterborne share in 1975 were: Canada (25 percent), Japan (23 percent) and Spain (17 percent) (Table B). Since 1971 Canada and Spain have increased their share wile Japan's has fallen sharply.



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	11873.0	-	85
H#	1968	11228.5	-5.4	82
I	1969	12585.2	12.1	86
S	1970	13915.5	10.6	89
T	1971	7631.4	-45.2	82
O	1972	7681.5	0.7	82
R	1973	11743.7	52.9	87
Y	1974	9034.8	-23.1	84
	1975	9846.0	9.0	82
F				
O				
R	1980	9939.0	0.2	-
E	1985	11967.4	3.8	-
C	1990	13957.9	3.1	-
A	1995	16540.9	3.5	-
S	2000	19601.9	3.5	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF ORES AND SCRAP
Percent of Total Weight

	1971	1972	1973	1974	1975
Canada	16	19	19	20	25
Japan	44	37	41	36	23
Spain	7	9	8	10	17
Korea	5	5	7	8	8
Italy	7	9	3	5	6
Other	21	21	22	21	21
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

These exports grew in 5 of the 8 years shown. Yearly changes in waterborne volumes coincide with those in waterborne share. Other variables which appear to explain the trade are: U.S. mining production (positive); U.S. steel production (negative) and industrial production of our major trading partners (positive).

The forecast, based on the three production variables mentioned above, calls for exports of metallic ores and scrap to grow from 9.8 million long tons in 1975 to 19.6 million long tons by 2000, or an average annual growth rate of 2.8 percent. This compares to a Bureau of Mines' projection of 3 percent annual growth in rest-of-world demand for both iron ore and iron and steel products. The discrepancy may be due to losses in waterborne share.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 37329.90 - \underset{(-0.86)}{8673.38}(\text{U.S. Industrial Production--Primary Metals}) + 40916.10(\text{U.S. Industrial Production--Mining}) + \underset{(0.38)}{6047.06}(\text{Trade-Weighted Industrial Production for Canada, Japan and OECD Europe}) - \underset{(-1.06)}{959.38}(\text{Time}) - \underset{(-4.04)}{4400.56}(\text{Dummy, 1971-72})$$

$R^2 = .91$

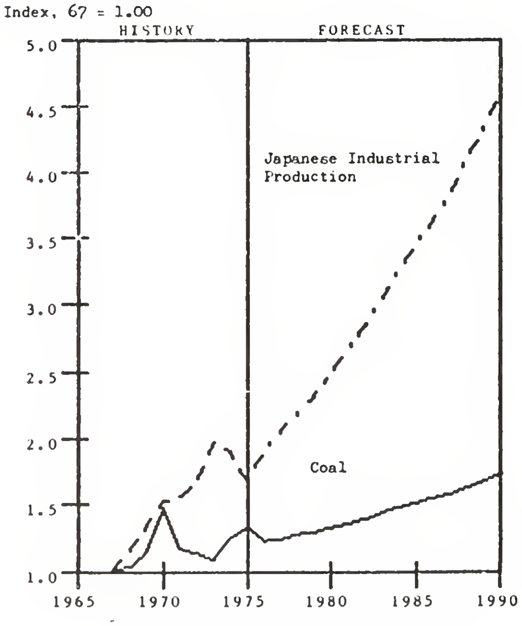
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

COAL

Schedule B Code: 321

Description: Coal is our second largest export group in terms of volume accounting for 24.5 percent of total U.S. waterborne exports in 1975. The waterborne share of total U.S. coal exports has ranged from 94 to 97 percent over the nine-year historical period, 1967-75 (Table A). Major markets for the waterborne share in 1975 were: Japan (38 percent), Canada (26 percent), Italy (7 percent), France (6 percent) and Holland (3 percent) (Table B).

The historical growth of these exports is similar to that of industrial production in the major markets. However, stockpiling in 1970 as world steel output soared probably contributed to the declines over the next three years. Coal exports increased sharply in 1974 as a threatened U.S. coal miners strike and oil price increases stimulated foreign demand.



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	44499.9	-	95
	1968	45495.6	2.2	95
	1969	50896.5	11.9	94
	1970	65240.5	28.2	97
	1971	51630.1	-20.9	96
	1972	50667.7	-1.9	96
	1973	48192.8	-4.9	97
	1974	55442.4	15.0	97
	1975	58898.2	6.2	97
FORECAST	1980	58829.2	-0.0	-
	1985	67041.8	2.6	-
	1990	76738.1	2.7	-
	1995	87643.7	2.7	-
	2000	100099.0	2.7	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705. FT 450. "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION
FOR WATERBORNE COAL EXPORTS
Percent of Total Weight

	1971	1972	1973	1974	1975
Canada	31	33	31	22	26
Japan	34	32	36	46	38
Italy	5	7	6	6	7
France	6	3	4	5	6
Holland	3	4	4	4	3
Other	21	21	19	17	20
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

The forecast, based on a projection of industrial production in Japan, calls for U.S. waterborne coal exports to grow from 58.9 million long tons in 1975 to 100 million long tons by 2000, or an annual growth rate of 2.1 percent. This is somewhat higher than the Bureau of Mines estimate of 1.2 percent for rest-of-world coal demand (bituminous). However, 1973 was the last year of historical data used for their estimate, and since 1973 was a slow year in coal trade and preceeded a sharp rise in oil prices, the Bureau of Mines estimate is probably biased downward.

Forecast from 1976 to 1990 based on the following equation:
Exports = 37652.70 + 8530.74(Japanese Industrial Production) + 14642.40
(1.88) (3.34)
Dummy, 1970)

$R^2 = .71$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

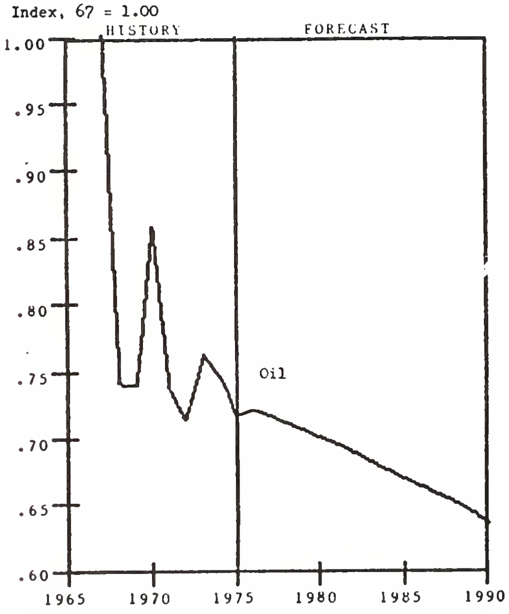
PETROLEUM

Schedule B Codes: 33 - petroleum which includes: 331 - crude petroleum; and 332 - petroleum products.

Composition: virtually all 332.

Description: Petroleum products, almost exclusively residues such as lubricants, waxes, and tar, averaged a little more than 10 million tons in the last nine years (Table A). They constituted 4.1 percent of the total U.S. waterborne export tonnage in 1975.

Exports of oil residues have declined slowly in the last five years. The major importing countries were: Japan (18 percent), Holland (15 percent), Mexico (11 percent), Canada (7 percent), and Belgium and Luxembourg (6 percent) (Table B).



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	13967.2	-	90
	1968	10311.5	-26.2	87
	1969	10272.0	-0.4	87
	1970	11967.5	16.5	88
	1971	10283.0	-14.1	89
	1972	9938.3	-3.4	84
	1973	10654.1	7.2	86
	1974	10235.1	-3.9	87
	1975	9792.2	-4.3	86
FORECAST	1980	9611.6	-0.4	-
	1985	9129.2	-1.0	-
	1990	8646.7	-1.1	-
	1995	8201.3	-1.1	-
	2000	7778.7	-1.1	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION
FOR WATERBORNE EXPORTS OF OIL AND PRODUCTS
Percent of Total Weight

	1971	1972	1973	1974	1975
Japan	22	20	20	23	18
Holland	7	7	7	10	15
Mexico	6	3	6	3	11
Canada	12	9	12	10	7
Belgium & Luxembourg	4	7	9	8	6
Other	49	54	46	46	43
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

The forecast, a time trend projection, shows the export tonnage declining to 7.8 million tons by 2000, down by 2 million tons from the 1975 level.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 17330.30 - \underset{(-.92)}{96.48}(\text{Time})$$

$R^2 = .12$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

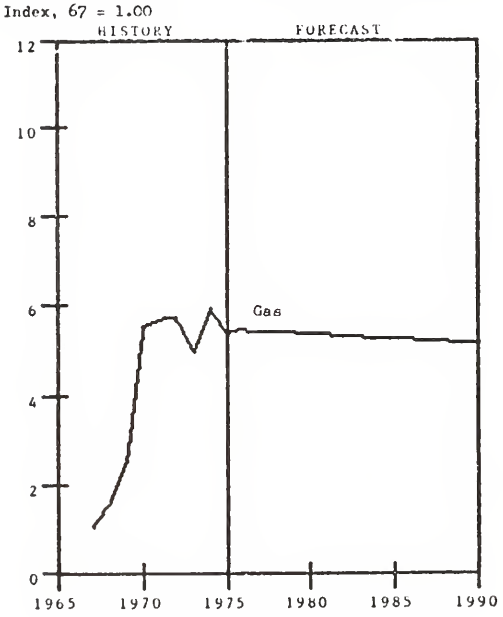
GAS

Schedule B Code: 341

Description: The U.S. exported via water slightly less than one million tons of gas, mostly natural gas, in 1975; and this constituted a mere 0.4 percent of total U.S. waterborne export tonnage in that year. Practically all, or 97 percent of the natural gas exported was to Japan from Alaska (Table B).

Gas exports increased rapidly from 171 thousand tons in 1967 to more than 900 thousand tons in 1970. Since then, however, the export tonnage has remained stable; although it peaked in 1974 surpassing one million tons, the tonnage slipped back to 922 thousand tons in 1975 (Table A).

Given a continued decline in gas production and excess demand conditions, it seems unlikely that these exports will



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	171.9	-	11
H#	1968	269.2	56.6	14
I	1969	435.7	61.9	20
S	1970	948.4	117.7	47
T	1971	975.6	2.9	40
O	1972	985.4	1.0	45
R	1973	853.9	-13.3	36
Y	1974	1018.7	19.3	24
	1975	922.2	-9.5	30
F				
O				
R	1980	922.1	-0.0	-
E	1985	903.0	-0.4	-
C	1990	883.9	-0.4	-
A	1995	865.4	-0.4	-
S	2000	847.3	-0.4	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION
FOR WATERBORNE GAS EXPORTS
Percent of Total Weight

	1971	1972	1973	1974	1975
Japan	98	98	99	99	97
Other	2	2	1	1	3
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

increase in the future, or even continue at the 1975 level. A simple time projection (using the 1970-75 data only) shows the 1990 export tonnage at 880,000 tons, 50,000 tons below the 1975 level.

Forecast from 1976 to 1990 based on the following equation:
Exports = 1227.54 - 3.82(Time)
(-.25)
$R^2 = .23$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

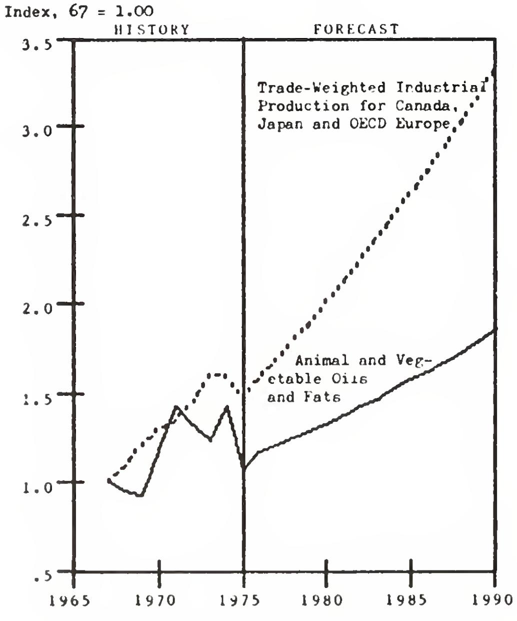
FATS AND OILS

Schedule B Codes: 411 - animal oils and fats nes.; 421 - fixed vegetable oils, soft; 422 fixed vegetable oils nec..

Composition: 55 percent 411; 38 percent 421; 7 percent 422.

Description: This group was 0.7 percent of total U.S. waterborne exports in 1975, down from 1 percent in 1974. The waterborne share of total exports of fats and oils has ranged from 96 percent in 1967 to 91 percent in 1974 with a slight downward trend from 1967 to 1975 (Table A). The largest market for the waterborne share in 1975 was Egypt with 18 percent. Other large markets are: Iran (6 percent), Holland (5 percent), Korea (5 percent), and England (4 percent) (Table B).

The historical growth of these exports has been erratic. The growth pattern has been similar to that of foreign industrial production, however, variables such as weather,



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	1618.2	-	96
H#	1968	1533.0	-5.3	94
I	1969	1476.4	-3.7	93
S	1970	1902.0	28.8	92
T	1971	2298.1	20.8	95
O	1972	2121.2	-7.7	95
R	1973	1978.7	-6.7	92
Y.	1974	2295.9	16.0	91
	1975	1685.0	-26.6	92
F				
O				
R	1980	2134.3	4.8	-
E	1985	2532.0	3.5	-
C	1990	2999.3	3.4	-
A	1995	3555.4	3.5	-
S	2000	4214.7	3.5	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF OILS AND FATS
Percent of Total Weight

	1971	1972	1973	1974	1975
Egypt	5	7	8	10	18
Iran	4	3	3	9	6
Holland	8	7	12	8	5
Korea	3	4	5	4	5
England	3	3	4	3	4
Other	77	76	68	66	62
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705 U.S. Exports

PL-480 shipments, acreage planted and yields per acre have caused sharp fluctuations in the export series.

The forecast, based on a projections of foreign industrial production, calls for waterborne exports of fats and oils to grow from 1.7 million long tons in 1975 to 4.2 million long tons by 2000.

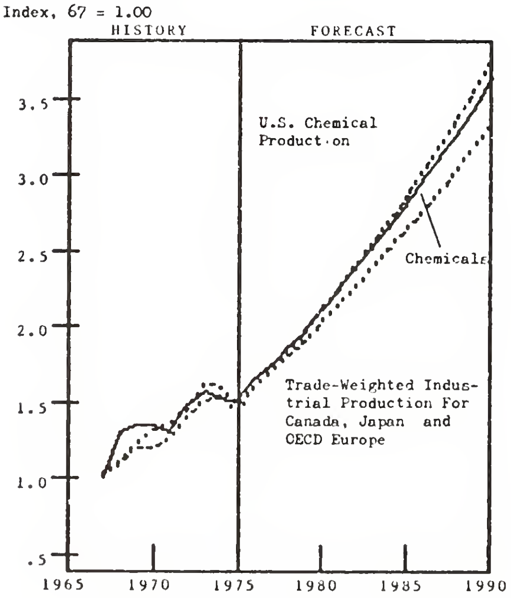
Forecast from 1976 to 1990 based on the following equation:
Exports = 2149.23 + 812.57(Trade-Weighted Industrial Production for Canada,
(.54)
Japan and OECD Europe) - 20.53(Time) + 306.17(Dummy, 1971-73)
(-.20) (1.20)
$R^2 = .58$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

CHEMICALS

Schedule B Codes: 5 - chemicals which includes: 512 - organic chemicals; 513 - inorganic chemical elements; 514 - inorganic chemicals except elements; 515 - radioactive and stable isotopes; 521 - mineral tar and tar oils; 531 - synthetic organic dyestuffs; 532 - dyeing and tanning extracts; 533 - pigments, paints, and varnish; 541 - perfumes, cosmetics and dentifrices; 554 - soaps and polishing preparations; 561 - manufactured fertilizers; 571 - explosives and pyrotechnic products; 581 - plastic materials and synthetic resins; 599 - chemical products and materials nec..

Composition: 37 percent 561; 21 percent 512; 21 percent 513; 6 percent 514; 6 percent 599; 5 percent 581; 2 percent 521; and negligible amounts of the remaining commodities.

Description: In 1975 chemicals accounted for 6.4 percent of the total U.S. waterborne export volume. The waterborne share of total U.S. chemical exports has ranged from 75 percent in 1968 and 1970 to 67 percent in 1972 with a slight downward trend from 1967 to 1975 (Table A). Major importing



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	10159.7	-	74
H#	1968	13300.9	30.9	75
I	1969	13712.0	3.1	71
S	1970	13682.4	-0.2	75
T	1971	13188.0	-3.6	71
O	1972	15005.8	13.8	67
R	1973	15909.4	6.0	69
Y	1974	15490.0	-2.6	71
	1975	15412.1	-0.5	71
F				
O				
R	1980	21442.4	6.8	-
E	1985	28368.5	5.8	-
C	1990	36878.9	5.4	-
A	1995	48364.9	5.6	-
S	2000	63428.2	5.6	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705. FT 450. "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION
FOR WATERBORNE CHEMICAL EXPORTS
Percent of Total Weight

	1971	1972	1973	1974	1975
Brazil	11	15	13	12	15
Holland	10	9	9	8	7
Japan	6	5	7	8	5
India	3	3	3	3	5
Canada	8	8	5	4	4
Other	62	60	63	65	64
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

countries in 1975 were: Brazil (15 percent), Holland (7 percent), Japan (5 percent), India (5 percent) and Canada (4 percent) (Table B).

The historical growth of these exports has paralleled that of U.S. chemical production and industrial production in our major trading partners.

The forecast, based on projections of these production variables, calls for waterborne chemical exports to grow from 15.4 million long tons in 1975 to 63.4 million long tons by 2000, or an annual growth rate of 5.8 percent.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 3988.29 - \underset{(-.17)}{1547.03}(\text{Trade-Weighted Industrial Production for Japan, Canada and OECD Europe}) + \underset{(0.98)}{10764.70}(\text{U.S. Industrial Production--Chemicals}) - \underset{(-.08)}{26.24}(\text{Time})$$

$R^2 = .84$

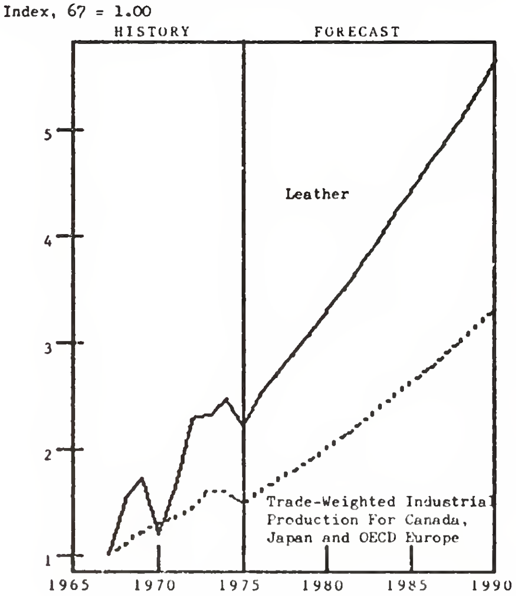
Forecast from 1990 to 2000 based On 1980 to 1990 growth rate.

LEATHER GROUP

Schedule B Codes: 61 - leather, leather manufactures and fur skins, dressed which includes: 611 - leather; 612 manufactures of leather nec.; and 613 - fur skins, dressed.

Composition: 90 percent 611; 9 percent 612; and 1 percent 613.

Description: Leather was only .01 percent of the total U.S. waterborne exports in 1975. The small volume of this trade reflects the world's tariff and non-tariff barriers which are geared to trade in hides and skins and discriminate violently against leather and leather products. Hopefully, leather tariff problems will be ameliorated through GATT negotiations. The waterborne share of total leather exports has ranged from 45 percent in 1967 to 27 percent in 1975, with a cyclical pattern over the nine years. The largest country of destination for the waterborne share in 1975 was Hong Kong with 39 percent of the volume. Other major destinations were: Taiwan (7 percent), England (6 percent), and the USSR (5 percent) (Table B).



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	7.9	-	45
H#	1968	11.9	49.9	37
I	1969	13.7	15.3	31
S	1970	9.4	-31.7	30
T	1971	13.0	38.6	28
O	1972	18.0	38.3	34
R	1973	18.4	2.4	34
Y	1974	19.6	6.5	29
	1975	17.5	-10.6	27
F				
O				
R	1980	26.0	8.2	-
E	1985	34.9	6.1	-
C	1990	44.7	5.1	-
A	1995	58.6	5.6	-
S	2000	76.9	5.6	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF LEATHER MANUFACTURES
Percent Of Total Weight

	1971	1972	1973	1974	1975
Hong Kong	52	54	49	39	39
China	10	8	7	17	7
Other	38	38	44	44	54
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports.

Except for a sharp drop in 1970, leather exports have paralleled the level of industrial production in our major trading partners.

Based on projections of foreign industrial production exports will grow from 17.5 thousand long tons in 1975 to 76.9 thousand long tons by 2000. Trade restrictions are a major uncertainty in this forecast.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = -36.39 + \underset{(0.85)}{10.20}(\text{Trade-Weighted Industrial Production for Canada, Japan and OECD Europe}) + \underset{(0.6)}{.52}(\text{Time}) - \underset{(-0.3)}{1.03}(\text{Dummy, 1970})$$

$R^2 = .79$

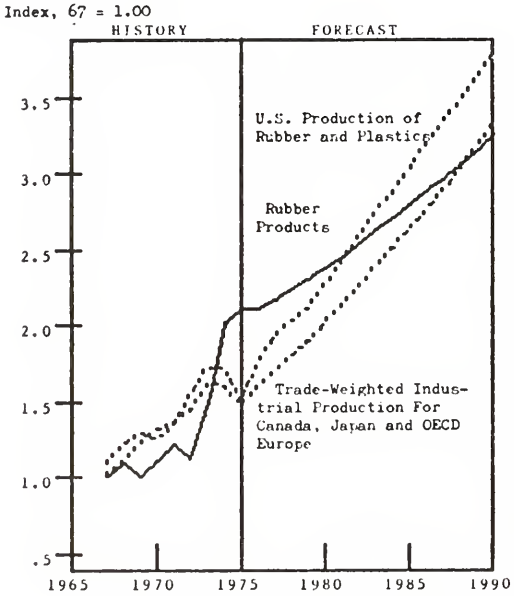
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

RUBBER MANUFACTURES

Schedule B Codes: 62 - rubber manufactures which includes: 621 - rubber manufactures, unvulcanized; and 629 - rubber manufactures, finished nec.

Composition: 71 percent 629.

Description: Rubber products include mainly automobile tires, tubes, and other articles of rubber. In 1975, the U.S. exported via vessels approximately 128 thousand tons of rubber manufactures and this constituted a very negligible portion (.05 percent) of total U.S. waterborne export tonnage in that year. The largest importing country was the U.S.S.R., importing mostly articles of rubber, with 17 percent of U.S. waterborne rubber exports in 1975. Australia (4 percent), and Venezuela (8 percent) imported mostly tires and tubes (Table B).



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	61.1	-	56
	1968	66.7	9.1	50
	1969	61.5	-7.7	47
	1970	68.1	10.6	52
	1971	73.8	8.4	47
	1972	68.7	-6.9	41
	1973	91.4	33.0	38
	1974	122.9	34.5	38
	1975	128.4	4.4	45
FORECAST	1980	145.4	2.5	-
	1985	170.6	3.2	-
	1990	198.9	3.1	-
	1995	232.6	3.2	-
	2000	272.0	3.2	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF RUBBER MANUFACTURES
Percent Of Total Weight

	1971	1972	1973	1974	1975
Soviet Union	8	5	10	12	17
Australia	8	4	7	9	4
Venezuela	2	3	2	2	8
Other	82	88	81	77	71
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports.

Except in 1969, the tonnage has steadily increased and doubled from 61,000 tons in 1967 to 128,000 tons in 1975 (Table A). The growth was particularly pronounced in 1973 and 1974 when an annual growth of 33 percent was experienced. The high historical waterborne export growth was due as much to the adequate domestic production as it was to foreign demand.

Based on projections of U.S. production of rubber and foreign demand represented by trade weighted industrial production for Canada, Japan, and OECD Europe, the forecast calls for slightly more than a 3 percent annual growth rate in the future.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 19.19 + \underset{(0.81)}{35.37}(\text{Trade-Weighted Industrial Production for Canada, Japan and OECD Europe}) + \underset{(0.11)}{4.52}(\text{U.S. Industrial Production--Rubber and Plastics}) + \underset{(6.90)}{45.54}(\text{Dummy, 1974-75})$$

$R^2 = .95$

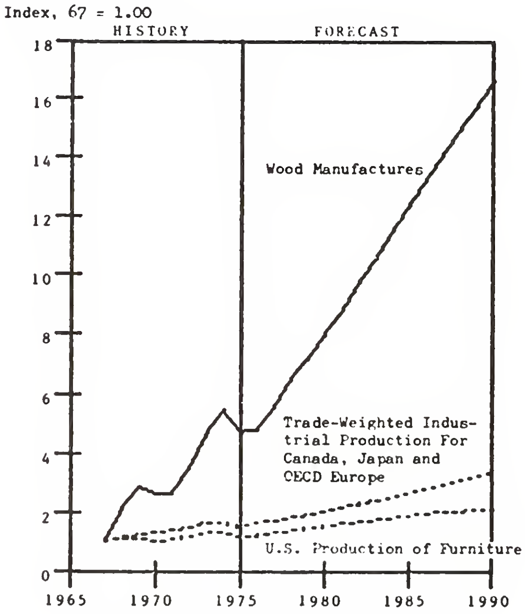
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

WOOD MANUFACTURES

Schedule B Codes: 63 - wood manufactures which includes: 631 - wood veneers and plywood boards; 632 - wood manufactures nec.; 633 - cork manufactures.

Composition: 98 percent 631; 2 percent 632; and negligible amounts of 633.

Description: Approximately 2.5 percent of the total U.S. waterborne export volume in 1975 was wood products. The waterborne share of total exports of wood products has ranged from 69 percent in 1970 to 62 percent in 1974, 75. (Table A). Japan is the dominant market for the waterborne share with 92 percent in 1975 (Table B).



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATERBORNE*
	1967	1287.3	-	64
H#	1968	2638.9	105.0	66
I	1969	3667.7	39.0	66
S	1970	3376.5	-7.9	69
T	1971	3311.5	-1.9	67
O	1972	4389.4	32.5	65
R	1973	6014.8	37.0	68
Y	1974	6983.8	16.1	62
	1975	6029.8	-13.7	62
F				
O				
R	1980	10284.0	11.3	-
E	1985	15879.5	9.1	-
C	1990	21328.3	6.1	-
A	1995	30715.0	7.6	-
S	2000	44233.0	7.6	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF WOOD MANUFACTURES
Percent Of Total Weight

	1971	1972	1973	1974	1975
Japan	96	95	94	95	92
Other	4	5	6	5	8
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports.

The major factor determining waterborne export volumes appears to be U.S. production of furniture and fixtures. A 7.5 percent decline in production in 1970 coincided with an 8 percent drop in waterborne exports of wood products. The only other large decline in these series came in 1975, -13.4 percent for production, and -13.7 percent for exports. Industrial production in our major trading partners, an indicator of foreign demand, also showed a high correlation with these exports.

The forecast, based on projections of the aforementioned production variables, calls for exports to grow from 6.0 million long tons in 1975 to 44 million long tons by 2000, an implied annual growth rate of 8.3 percent.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 9556.47 + \underset{(1.28)}{4786.08}(\text{U.S. Industrial Production--Furniture and Fixtures}) + \underset{(3.40)}{6349.68}(\text{Trade-Weighted Industrial Production for Canada, Japan and OECD Europe})$$

$R^2 = .88$

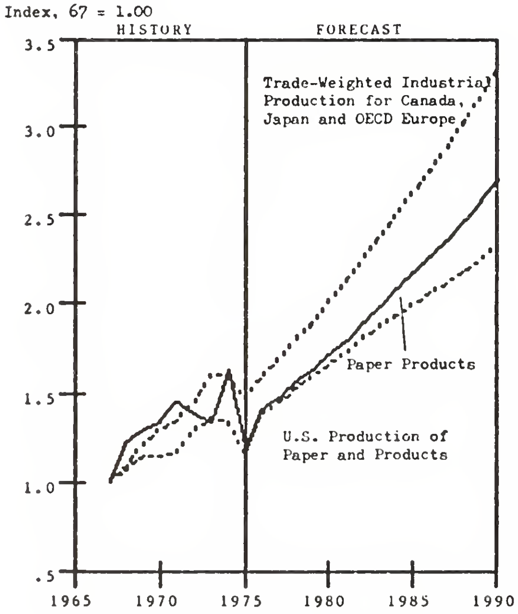
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

PAPER MANUFACTURES

Schedule B Codes: 64 - paper manufactures which includes: 641 - paper and paperboard; and 642 - articles of paper pulp and paper.

Composition: 94 percent 641.

Description: Paper manufactures accounted for 0.8 percent of total U.S. waterborne exports in 1975. The waterborne share of total U.S. exports of paper manufactures has generally declined from 75 percent in 1967 to 62 percent in 1975 (Table A). Major importers of the waterborne segment in 1975 were: Germany (10 percent), England (9 percent), Ecuador (5 percent), Italy (3 percent), Japan (3 percent), Israel (4 percent), Australia (3 percent), and Coasta Rica (4 percent) (Table B).



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	1660.5	-	75
H#	1968	2043.8	23.1	77
I	1969	2142.0	4.8	74
S	1970	2205.2	3.0	76
T	1971	2405.5	9.1	72
O	1972	2292.1	-4.7	69
R	1973	2212.4	-3.5	69
Y	1974	2695.8	21.8	70
	1975	1971.0	-26.9	62
F				
O				
R	1980	2837.0	7.6	-
E	1985	3600.4	4.9	-
C	1990	4483.2	4.5	-
A	1995	5635.8	4.7	-
S	2000	7084.7	4.7	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF PAPER MANUFACTURES
Percent Of Total Weight

	1971	1972	1973	1974	1975
Germany	16	16	12	11	10
England	11	10	10	10	9
Italy	9	9	7	5	3
Ecuador	5	5	5	4	5
Other	59	60	66	70	73
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports.

Waterborne exports of paper manufactures grew in 5 of the 8 years shown. Declines in 1972-73 (-4.7 percent and -3.5 percent) coincided with sharply rising prices for pulpwood. The severe drop in 1975 (-26.9 percent), on the other hand, reflected a 13.5 percent decline in domestic paper production as well as a 7.3 percent fall in production of our major trading partners.

Based on projections for the aforementioned production variables waterborne exports of paper manufactures will grow from 1971 thousand long tons in 1975 to 7085 thousand long tons by 2000. This implies an annual growth rate of 5.3 percent.

Forecast from 1976 to 1990 based on the following equation:
Exports = 4298.34 - 67.31(Time) + 1459.00(Trade-Weighted Industrial Production for Canada, Japan and OECD Europe) + 604.70(U.S. Industrial Production--Paper Products)

$R^2 = .58$

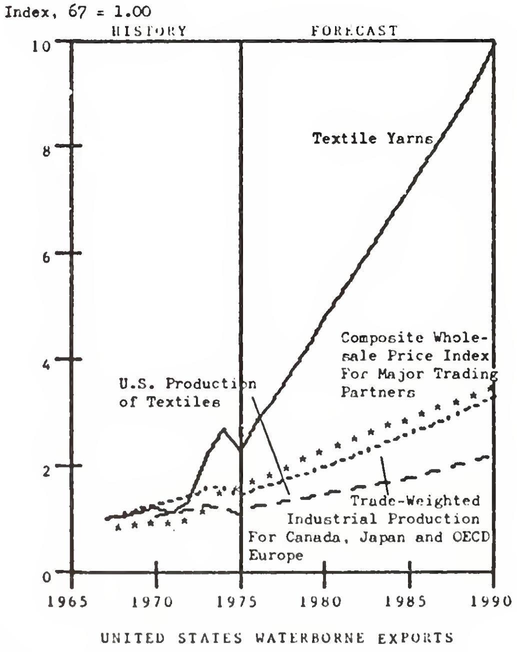
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

TEXTILE YARNS AND FABRICS

Schedule B Codes: 65 - textile yarns and fabrics which include: 651 - textile yarn and thread; 652 - cotton fabrics; 653 - textile fabrics; 654 - tulle, lace, embroidery, etc.; 655 - special textile fabrics; 656 - made-up textile fabrics nec.; and floor covering, tapestries, etc.

Composition: 26 percent 651; 24 percent 652; 16 percent 656; 14 percent 653; 11 percent 657; 8 percent 655; and 1 percent 654.

Description: Textile fibers were 0.2 percent of the total U.S. waterborne volume in 1975. The waterborne share of total U.S. textile exports has fluctuated between 65 and 59 percent from 1967 to 1975 (Table A). Major countries of destination for the waterborne share in 1975 were: Belgium and Luxembourg (13 percent), England (9 percent), Australia (6 percent), Switzerland (5 percent), Japan (4 percent), and Holland (3 percent. Belgium and Luxembourg have increased their shares while Switzerland's has declined (Table B).



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
H# ISTORY	1967	164.4	-	65
	1968	174.9	6.4	65
	1969	184.5	5.5	63
	1970	202.5	9.7	65
	1971	189.8	-6.3	59
	1972	221.1	16.5	59
	1973	361.2	63.4	65
	1974	446.3	23.6	65
	1975	377.1	-15.5	62
FORECAST	1980	785.3	15.8	-
	1985	1184.6	8.6	-
	1990	1628.2	6.6	-
	1995	2344.5	7.6	-
	2000	3376.0	7.6	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705. FT 450. "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE
EXPORTS OF TEXTILE YARNS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Belgium and Luxembourg	7	8	7	10	13
England	8	7	7	8	9
Switzerland	9	4	3	4	5
Japan	6	10	13	8	4
Australia	5	4	7	8	6
Holland	4	5	6	6	3
Other	61	62	57	56	60
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports.

Waterborne exports of textile fibers grew in 6 of the 8 years shown. The 6.3 percent decline in 1971 followed a 6.2 percent drop in U.S. textile production in 1970. There was also a 6 percent decline in waterborne share in 1971 (a year in which Gulf, Atlantic and Pacific port operations were hampered by longshoremen strikes). Exports declined again in 1975 by 15.5 percent--this time coupled with a 9.8 percent fall in U.S. textile production; a 6.3 percent drop in production of our major trading partners; and a 3 percent loss in waterborne share.

The forecast, based on projections of the aforementioned production variables as well as a composite wholesale price index for our major trading aprtners, calls for waterborne textile exports to grow from 377 thousand long tons in 1975 to 3.4 million long tons by 2000. This implies an annual growth rate of 9.2 percent.

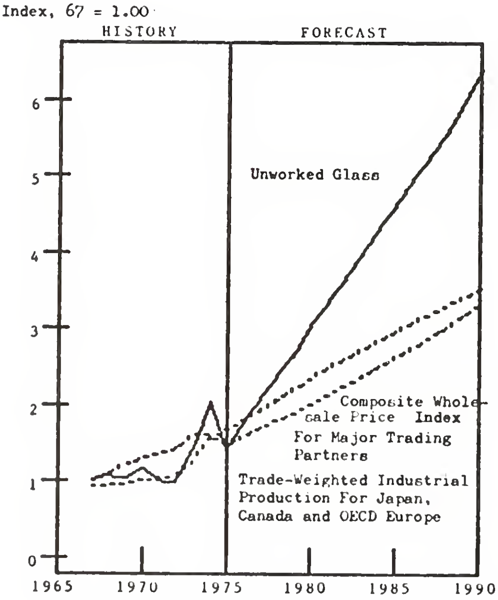
Forecast from 1976 to 1990 based on the following equation:
Exports = 2464.93 + 503.49(Trade-Weighted Industrial Production for Canada
(5.18)
Japan and OECD Europe) + 112.91(U.S. Industrial Production--Textiles) -
(1.20)
50.60(Time) + 510.00(Composite Wholesale Price Index of Major U.S. Trading
(-6.30) (13.86)
Partners
$R^2 = .99$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

UNWORKED GLASS

Schedule B Code: 664.

Description: Unworked glass, mainly of plate and float glass surface ground of polished but not further worked, occupied a negligible portion of total U.S. waterborne tonnage in 1975. The waterborne share of total exports of this category has been less than 40 percent (Table A). They are mostly shipped to Venezuela (12 percent), Australia (9 percent), Germany (9 percent), Brazil (7 percent), and England (5 percent) (Table B).

In 1967, the U.S. exported via vessel 49,800 long tons (LT) of unworked glass but that volume did not grow at all until 1973 when it reached 71,500 LT. In 1974, it peaked at 101,300 LT, but dropped sharply to 69,900 LT in 1975. The export volume of unworked glass seems to be especially sensitive to both prices and the level of economic activity in the importing countries.



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	49.8	-	40
	1968	53.6	7.6	42
	1969	51.3	-4.3	41
	1970	58.3	13.6	39
	1971	49.9	-14.4	33
	1972	48.6	-2.5	32
	1973	71.5	47.1	36
	1974	101.3	41.7	39
	1975	69.9	-31.0	37
FORECAST	1980	149.2	16.4	-
	1985	228.6	8.9	-
	1990	317.7	6.8	-
	1995	463.4	7.8	-
	2000	676.1	7.8	-

* BASED ON DOLLAR VALUE.

# SOURCE: BUREAU OF THE CENSUS. SA 705. FT 450. "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF UNWORKED GLASS
Percent of Total Weight

	1971	1972	1973	1974	1975
Australia	14	18	22	16	9
Germany	22	15	9	7	9
Venezuela	7	10	10	10	12
England	8	6	6	4	5
Brazil	3	5	7	10	7
Other	46	46	46	47	58
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

The export tonnage is expected to recover to the 1974 peak level in the near future and will continue to expand at the high growth rate of 7 to 8 percent a year throughout the forecast horizon.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 983.46 - \underset{(-5.47)}{17.86}(\text{Time}) + \underset{(5.5)}{153.82}(\text{Production Index for Canada, Japan, and OECD Europe}) + \underset{(7)}{122.33}(\text{W.P.I. for major U.S. Trading Partners})$$

$R^2 = .92$

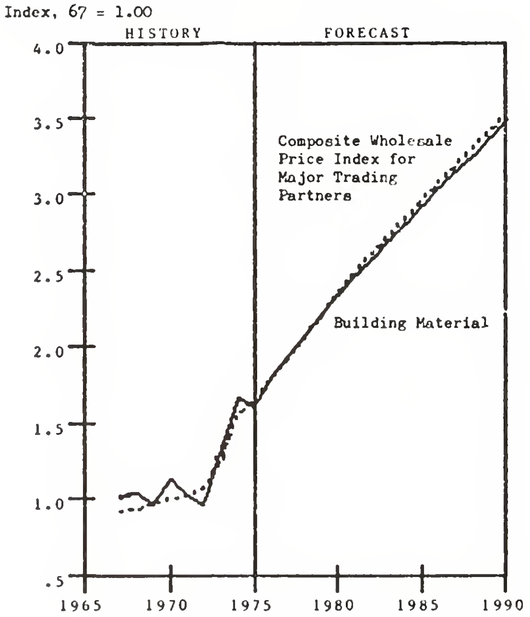
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

BUILDING MATERIALS

Schedule B Codes: Includes: 661 - building materials, lime and cement; 662 - clay and refactory construction material; 663 - mineral manufactures nec..

Composition: 48 percent 661; 36 percent 662; and 16 percent 663.

Destination: The exports of construction materials consist mainly of refactory bricks and tiles, and cement. In 1975, 528 thousand tons of a mere 0.2 percent of total U.S. waterborne export tonnage were building materials. The major countries of destination were: Canada (19 percent), Dominican Republic (8 percent), Germany (6 percent), Leeward and Windwand Islands (4 percent), Italy (3 percent) and Brazil (3 percent) (Table B).



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	330.7	-	54
HISTORY#	1968	343.4	3.9	53
	1969	317.0	-7.7	54
	1970	368.8	16.3	55
	1971	336.0	-8.9	54
	1972	317.8	-5.4	52
	1973	441.6	39.0	50
	1974	547.4	24.0	49
	1975	528.1	-3.5	52
FORECAST	1980	769.7	7.8	-
	1985	963.4	4.6	-
	1990	1150.8	3.6	-
	1995	1407.3	4.1	-
	2000	1720.8	4.1	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION
FOR WATERBORNE EXPORTS OF BUILDING MATERIALS
Percent of Total Weight

	1971	1972	1973	1974	1975
Canada	3	4	19	17	19
Germany	12	13	9	7	6
Italy	7	7	5	4	3
Dominican Republic	2	2	4	9	8
Brazil	3	2	4	3	3
Leeward & Windward Isl.	3	3	4	3	4
Other	70	69	56	57	57
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

Until 1972, there was virtually no growth of cement and brick exports: the export tonnage lingered around 320-370 thousand tons between 1967 and 1972. Rapid growth, however, occurred over the next two years and cement and brick exports reached the level of nearly 550,000 tons in 1974.

The forecast calls for a continuation of growth at 4 percent per year throughout the forecast horizon. The main export stimulus seems to have been the inflation outside the U.S., along with the dollar devaluation, and this competitive edge will probably be reduced during the 1980's.

Forecast from 1980 to 1990 based on the following equation:
Exports = 31.14 + 314.01(Composite Wholesale Price Index of Major U.S. Trading Partners)

$R^2 = .91$

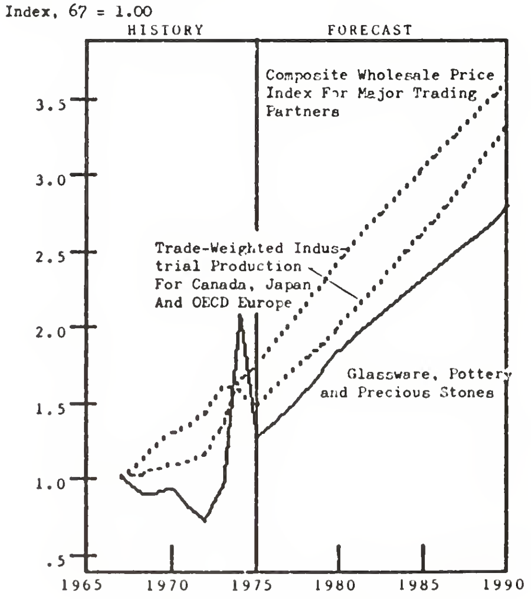
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

GLASSWARE, POTTERY AND PRECIOUS STONES

Schedule B Codes: Includes: 665 - glassware; 666 - pottery; and 667 - precious stones.

Composition: 98 percent 665; 2 percent 666; and small amounts of 667.

Description: Major products of glass and clay exported are tablewares and other articles of glass used in homes, restaurants and hotels (60 percent), and commercial containers and closures of glass. A very small portion of these exports consist of pottery and precious stones. The waterborne share constituted only 17 percent of total U.S. exports of glasswares in 1975 because most of them were shipped over land to Canada (Table A). In terms of waterborne exports, England (12 percent), Australia (8 percent), Venezuela (7 percent), Panama (7 percent), and Holland (5 percent) were the major importers (Table B).



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	60.1	-	23
H#	1968	54.7	-9.0	17
I	1969	53.8	-1.7	15
S	1970	56.1	4.2	17
T	1971	48.7	-13.1	16
O	1972	43.5	-10.7	12
R	1973	56.7	30.4	10
Y	1974	124.8	119.9	16
	1975	76.2	-38.9	17
F				
O				
R	1980	110.3	7.7	-
E	1985	139.4	4.8	-
C	1990	167.8	3.8	-
A	1995	206.9	4.3	-
S	2000	255.2	4.3	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705. FT 450. "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF GLASSWARE, POTTERY, AND PRECIOUS STONE
Percent of Total Weight

	1971	1972	1973	1974	1975
England	2	4	6	37	12
Holland	12	4	6	5	5
Venezuela	10	11	6	4	7
Australia	8	8	9	7	8
Panama	11	6	4	4	7
Other	57	67	69	43	61
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

The exports of glass products have scarcely grown between 1967 and 1975, except in 1974, when there was a doubling of these exports due to unusually large shipments of containers and closures of glass to England.

Paralleling projections of wholesale price and income increases abroad, the forecast calls for an annual growth rate of 7.7 percent up to 1980 and approximately 4 percent thereafter. Increasing competition from metal cans and plastic bottles may soften this prospect in the future.

Forecast from 1976 to 1990 based on the following equation:
Exports = 454.27 - 7.39(Time)+ 87.23(Composite Wholesale Prices of Major
(-2.92) (6.04)
Trading Partners) + 21.57(Trade-Weighted Industrial Production for Canada,
(1.02)
Japan and OECD Europe) + 47.78 (Dummy, 1974-75)
(10.15)
$R^2 = .99$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

UTENSILS

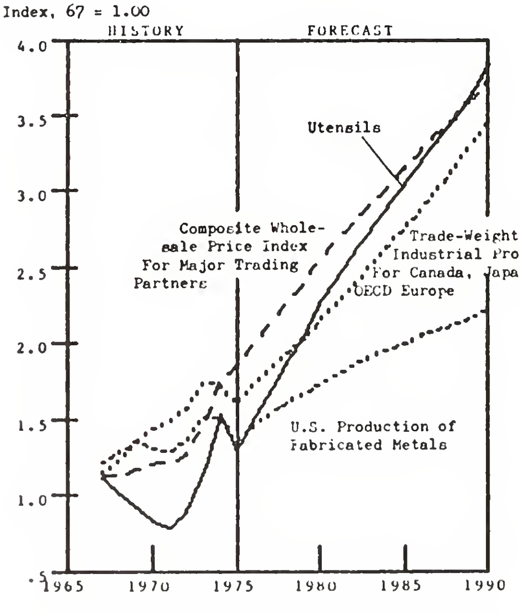
Schedule B Codes: Includes: 696 - table flatware and cutlery; and 697 - household equipment of base metal.

Composition: 89 percent 697.

Description: The exports of household utensils, at 13,700 long tons (LT) in 1975, were only .01 percent of the total U.S. waterborne export volume.

During the nine-year history, the volume of trade slid down in the first five years, but picked up in subsequent years (Table A). The tonnage reached the level of 16,400 LT in 1974, but fell again in 1975.

The exports of household utensils are sensitive to both prices and incomes abroad. In addition, these exports seem to compete directly with the domestic consumer.



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	11.6	-	53
H#	1968	10.5	-9.7	55
I	1969	9.3	-11.1	50
S	1970	8.4	-9.8	53
T	1971	7.8	-7.5	45
O	1972	9.0	15.3	42
R	1973	12.2	35.8	45
Y	1974	16.4	34.8	48
	1975	13.7	-16.4	46
F				
O				
R	1980	24.7	12.5	-
E	1985	33.9	6.5	-
C	1990	43.1	4.9	-
A	1995	56.8	5.7	-
S	2000	75.1	5.7	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERORNE
EXPORTS OF UTENSILS
Percent Of Total Weight

	1971	1972	1973	1974	1975
Japan	6	8	12	9	14
Dominican Republic	6	6	5	5	5
Venezuela	8	7	4	4	5
Au tralia	3	3	3	5	6
England	6	5	5	5	7
France	2	2	2	3	2
Germany	2	8	5	6	3
Italy	3	4	4	5	7
Leban	3	2	5	3	3
Iran	1	1	1	2	4
Saudi Arabia	1	3	2	4	5
Other	59	51	52	49	39
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports.

If the production of fabricated metals continues to satisfy both domestic and foreign demand the exports may triple from the 1975 volume to 43 thousand tons by 1990.

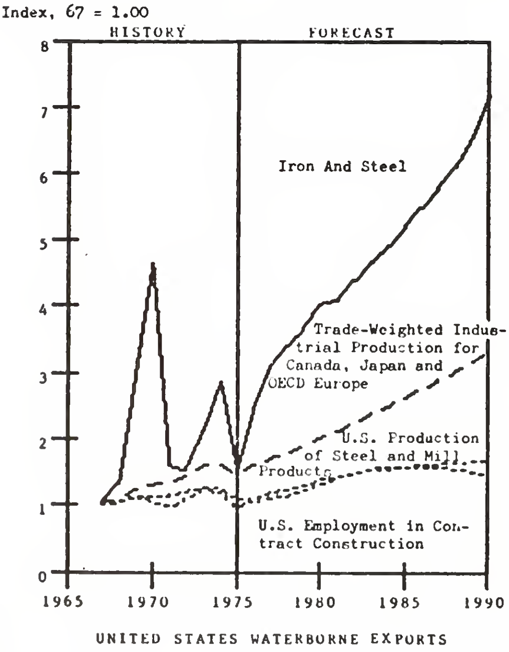
Forecast from 1976 to 1990 based on the following equation:
Exports = 126.35 - 2.25(Time) + 9.98(Trade-Weighted Industrial Production for Canada, Japan and OECD Europe) + 5.84(U.S. Industrial Production--Fabricated Metals) + 21.06(Composite Wholesale Price Index of Major U.S. Trading Partners)
$R^2 = .94$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

IRON AND STEEL

Schedule B Codes: 67 - iron and steel which includes: 671 - pig iron; 672 - iron and steel primary forms; 673 - iron and steel bars; 674 - iron and steel plates and sheets; 675 - hoop and strip of iron or steel; 676 - rails or railway track material; 677 - iron or steel wire; 678 - iron or steel tubes, fittings; 679 - iron or steel castings, forgings.

Composition: 43 percent 678; 22 percent 674; 11 percent 672; 11 percent 673; 6 percent 676; 2 percent 671; 2 percent 675; 2 percent 679; and 1 percent 677.

Description: In 1975 these exports represented 0.8 percent of the total U.S. waterborne export volume, down from 1.6 percent in 1974. The waterborne share of total exports of iron and steel has been cyclical rising from 61 percent in 1967 to 76 percent in 1970; falling to 58 percent in 1972 and rising again to 69 percent in 1975 (Table A). The major markets for the waterborne share in 1975 were: Brazil (8



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	1313.8	-	61
H#	1968	1753.1	33.4	63
I	1969	3935.4	124.5	66
S	1970	6086.9	54.7	76
T	1971	2083.4	-65.8	62
O	1972	1999.2	-4.0	58
R	1973	2798.4	40.0	59
Y	1974	3755.0	34.2	64
	1975	1969.0	-47.6	69
F				
O				
R	1980	5258.5	21.7	-
E	1985	6808.3	5.3	-
C	1990	9412.0	6.7	-
A	1995	12591.9	6.0	-
S	2000	16846.2	6.0	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE
EXPORTS OF IRON AND STEEL
Percent of Total Weight

	1971	1972	1973	1974	1975
Brazil	8	7	17	23	8
Italy	14	9	5	5	1
Argentina	4	6	8	4	3
Pakistan	10	4	4	2	1
Other	64	74	66	66	87
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

percent), Venezuela (8 percent), Iran (9 percent), Taiwan (4 percent), Peru (5 percent), Argentina (3 percent), England (3 percent), and Italy and Pakistan (1 percent each). Venezuela, Iran, Taiwan and Peru have increased their shares from 1971 to 1975 while those of Italy, Pakistan, India, and Vietnam have declined (Table B).

Exports of iron and steel have grown in 5 of the 8 years shown. The sharp decline in 1971 coincided with an 8.6 percent fall in U.S. iron and steel production and a 14 percent decline in waterborne share of total iron and steel exports. U.S. construction activity was strong at the time which aggravated a tight supply situation. The other major decline occurred in 1975 as U.S. steel production as well as industrial production in our major trading partners fell sharply.

The forecast, based on projections of U.S. steel output, foreign industrial production and U.S. construction activity, calls for waterborne iron and steel exports to grow from a depression low of 1969 thousand long tons in 1975 to 16.8 million long tons by 2000 or an average annual growth rate of 9.1 percent. Although this rate appears high it is largely the result of a low base, 1975. A 25-year rate calculated using the 1970 peak as a base is a more moderate 4.2 percent per year.

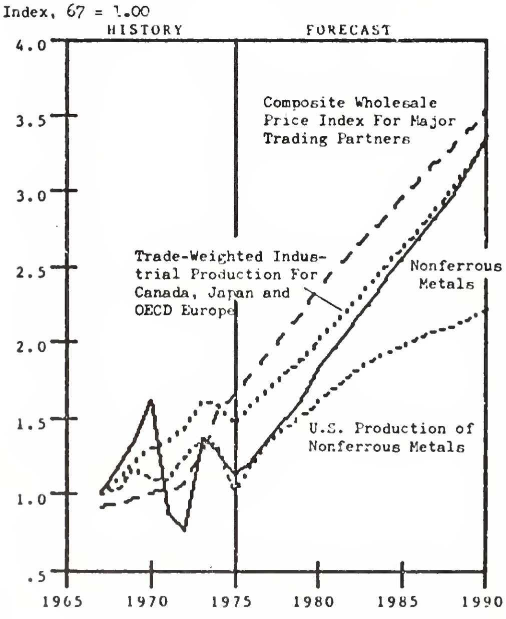
Forecast from 1976 to 1990 based on the following equation:
Exports = -3844.40 + 1682.00(Trade-Weighted Industrial Production for Canada,
(.46)
Japan, and OECD Europe) + 7951.00(U.S. Industrial Production--basic steel
(1.56)
and mill products) - 1233.41(U.S. Employment in Contract Construction)+ 3742.83
(-.36) (4.28)
(Dummy, 1970)
$R^2 = .85$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

NONFERROUS METALS

Schedule B Codes: 68 - nonferrous metals which includes: 681 - silver and platinum; 682 - copper and copper alloy; 683 - nickel and nickel alloys; 684 - aluminum and aluminum alloys; 685 - lead and lead alloys; 686 - zinc and zinc alloys; 687 - tin and tin alloys; 688 - uranium and thorium metal; and 689 - nonferrous base metals nec..

Composition: 50 percent 684; 34 percent 682; 7 percent 689; 3 percent 685; 2 percent 683; 2 percent 686; negligible amounts of the remaining commodities.

Description: Waterborne exports of nonferrous metals (50 percent aluminim and 35 percent copper) at 500 thousand long tons in 1975 represented merely 0.2 percent of total U.S. waterborne export tonnage in that year. Five major importing countries were: Japan (12 percent), Germany (9 percent), Brazil (8 percent), England (7 percent), and France (6 percent) (Table B). These five countries imported altogether 52 percent of U.S. waterborne nonferrous metal exports in 1971 but the percentage declined to 42 percent in 1975.



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	442.9	-	71
H#	1968	516.9	16.7	71
I	1969	594.1	14.9	73
S	1970	718.6	21.0	78
T	1971	387.7	-46.1	67
O	1972	341.7	-11.8	63
R	1973	602.7	76.4	65
Y	1974	560.1	-7.1	61
	1975	502.9	-10.2	62
F				
O				
R	1980	798.4	9.7	-
E	1985	1123.6	7.1	-
C	1990	1486.2	5.8	-
A	1995	2027.6	6.4	-
S	2000	2766.2	6.4	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705. FT 450. "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF NONFERROUS METAL
Percent of Total Weight

	1971	1972	1973	1974	1975
Japan	7	15	23	17	12
Germany	23	12	10	7	9
Brazil	7	8	9	12	8
England	7	9	7	9	7
France	8	8	5	5	6
Other	48	48	46	50	58
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

Similarly the waterborne share declined somewhat during the same period (Table A).

The exports of nonferrous metals showed erratic fluctuations from 1967 to 1975, with a low of 342 thousand long tons and a high of 719. The sharp increase in energy costs following the oil embargo by OPEC in late 1973, followed by increases in bauxite mining taxes and levies by countries, that are the source of most of the aluminum raw materials requirements of the United States, resulted in substantial increases in the cost of producing aluminum and slowed down production in 1974 and 1975. These factors, along with concomitant increases in the cost of building production facilities during 1973-75 foreshadowed higher prices for aluminum which could change aluminum demand growth and supply patterns.

Exports of nonferrous metals were influenced by the level of domestic production, world prices, and the level of economic activity in the importing countries. Based on these relationships, the forecast growth is put at more than 6 percent per year, substantially above the historical pace.

Forecast from 1976 to 1990 based on the following equation:
Exports = 6297.38 - 107.00(Time) + 744.71(Trade-Weighted Industrial Pro-
(-.74) (.37)
duction for Canada, Japan and OECD Europe) + 71.89(U.S. Industrial Pro-
(.06)
duction--Nonferrous Metals) + 621.05(Composite Wholesale Price Index of
(1.53)
Major U.S. Trading Partners) + 247.04(Dummy, 1970)
(1.80)

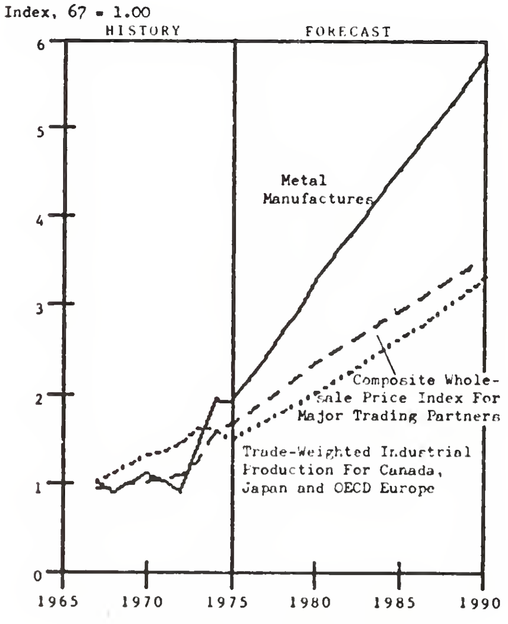
$R^2 = .72$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

OTHER MANUFACTURES OF METAL

Schedule B Codes: Includes: 691 - finished structural metal parts nec.; 692 - metal containers for storage; 693 - wire products and non lectrial fencing; 694 - nails, screws, nuts and bolts etc.; 695 - hand and machine tools; and 698 - manufactures of metal nec..

Composition: 52 percent 691; 21 percent 698; 10 percent 693; 7 percent 692; 7 percent 695; and 3 percent 694.

Description: Waterborne exports of metal manufactures, mainly finished structural iron or steel parts and structures as well as some wire cables, ropes, etc., accounted for merely 0.2 percent of the total U.S. waterborne export trade in 1975. The largest single market for the waterborne share in 1975 was Venezuela with 6.4 percent (Table B).



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	250.8	-	50
H#	1968	224.0	-10.7	49
I	1969	250.5	11.9	47
S	1970	274.3	9.5	51
T	1971	255.2	-7.0	48
O	1972	221.0	-13.4	44
R	1973	362.4	64.0	47
Y	1974	484.8	33.8	50
	1975	479.3	-1.1	56
F				
O				
R	1980	817.2	11.3	-
E	1985	1136.4	6.8	-
C	1990	1464.2	5.2	-
A	1995	1960.0	6.0	-
S	2000	2623.5	6.0	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

VENEZUELA'S SHARE OF TOTAL WATERBORNE EXPORTS OF METAL MANUFACTURES
Percent Of Total Weight

1971	1972	1973	1974	1975
4.1	5.7	4.4	3.2	6.4

Source: U.S. Bureau of Census, Sa 705, U.S. Exports.

Until 1972, shipments fluctuated between 220 and 275 thousand long tons (Table A). The volume increased to 484,000 tons in 1974, but dropped slightly again in 1975.

In general these exports paralleled, but with much sensitivity, the rate of inflation and industrial production abroad. As the world's economy picks up again from the trauma of energy crisis, the traditional trading partners as well as developing nations of the world are expected to import more of these U.S. goods; first at 11.3 percent per year rate through 1980, but at a much slower rate of 6 percent thereafter.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 2301.95 - \underset{(-3.29)}{43.04}(\text{Time}) + \underset{(2.62)}{293.34}(\text{Trade-Weighted Industrial Production for Canada, Japan and OECD Europe}) + \underset{(8.37)}{585.33}(\text{Composite Wholesale Prices of Major Trading Partners})$$

$R^2 = .99$

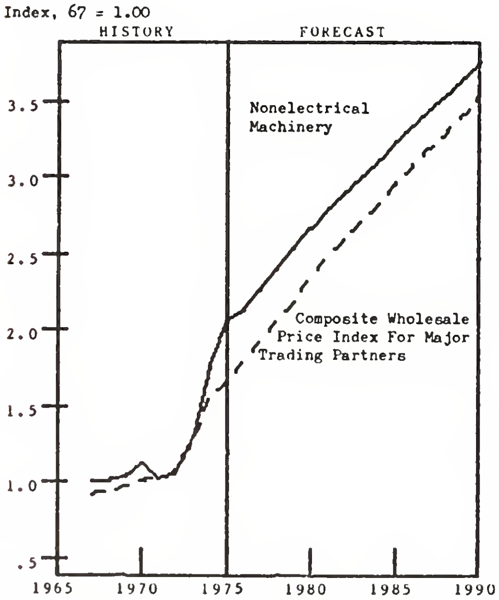
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

NONELECTRICAL MACHINERY

Schedule B Codes: 71 - nonelectrical machinery which includes: 711 - power generating machinery; 712 - agricultural machinery; 714 - office machines and parts; 715 - metalworking machines and parts; 717 - textile and leather machines; 718 - machinery for special industries; 719 - machinery and appliances nec..

Composition: 42 percent 719; 27 percent 718; 14 percent 712; 9 percent 711; 5 percent 715; 3 percent 717; and negligible amounts of 714.

Description: In 1975 this group represented 1 percent of the total U.S. waterborne export volume. The waterborne share of total exports of non-electrical machinery has ranged from 53 to 44 percent over the period, 1967 to 1975 (Table A). Major markets for the waterborne share in 1975 were: Venezuela (7 percent), Iran (5 percent), Brazil (5 percent), Australia (4 percent), England (4 percent), USSR (3 percent), Saudi Arabia



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	1210.6	-	53
H#	1968	1213.4	0.2	53
I	1969	1247.5	2.8	49
S	1970	1362.6	9.2	51
T	1971	1229.1	-9.8	45
O	1972	1277.6	3.9	44
R	1973	1558.9	22.0	44
Y	1974	2128.0	36.5	47
	1975	2488.9	17.0	53
F				
O				
R	1980	3224.5	5.3	-
E	1985	3898.5	3.9	-
C	1990	4536.4	3.1	-
A	1995	5380.7	3.5	-
S	2000	6382.2	3.5	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF NONELECTRICAL MACHINERY

Percent of Total Weight

	1971	1972	1973	1974	1975
Venezuela	6	7	5	5	7
Brazil	5	7	6	6	5
Australia	5	4	5	6	4
South Africa	3	3	3	3	3
Other	81	79	81	80	81
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

(3 percent), Japan (3 percent), and South Africa (3 percent) (Table B). Saudi Arabia, Iran and the USSR have increased their share while Japan's has fallen.

These exports more than doubled from 1967 to 1975. The most important factors responsible for this growth, particularly the 1973-75 boom have been U.S. price competitiveness and the expansion of Middle Eastern markets.

The rapid growth from 1973 to 1975 is not expected to continue, but rather indicates an upward shift in the growth pattern for these exports. Consequently, the forecast calls for an annual growth rate of 3.8 percent from 1975 to 2000 as compared to the double digit rates of the last three years.

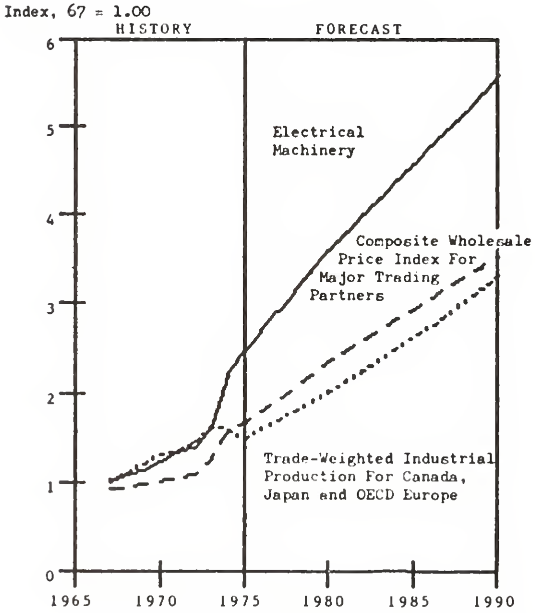
Forecast from 1976 to 1990 based on the following equation:
Exports = 287.47 + 431.89(U.S. Industrial Production--Nonelectrical
(-.99)
Machinery) + 1435.20(Composite Wholesale Price Index of Major U.S.
(3.50)
Trading Partners) + 259.52(Dummy, 1974-1990)
(1.24)
$R^2 = .98$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

ELECTRICAL MACHINERY

Schedule B Codes: 72 - electrical machinery which includes: 722 - electric power machinery; 723 equipment for distributing electricity; 724 - telecommunications apparatus; 725 - electric refrigerators; 726 - electric apparatus, medical; 729 - electric machinery nes..

Composition: 42 percent 729; 30 percent 722; 11 percent 723; 11 percent 725; and 6 percent 724.

Description: This group accounted for 0.2 percent of the total U.S. waterborne export volume in 1975. The waterborne share of total exports of electrical machinery has generally declined from 38 percent in 1967 to 24 percent in 1973 (Table A). It has since rebounded to 31 percent in 1975. Major markets for the waterborne share in 1975 were: Norway (8 percent), Venezuela (5 percent), Holland (4 percent), Iran (6 percent), and Saudi Arabia (5 percent). Iran and Saudi Arabia have



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	210.6	-	38
H#	1968	226.6	7.6	35
I	1969	233.1	2.8	28
S	1970	259.4	11.3	30
T	1971	280.5	8.1	28
O	1972	286.8	2.2	27
R	1973	337.1	17.5	24
Y	1974	460.5	36.6	26
	1975	522.5	13.5	31
F				
O				
R	1980	755.8	7.7	-
E	1985	964.4	5.0	-
C	1990	1170.9	4.0	-
A	1995	1457.5	4.5	-
S	2000	1814.1	4.5	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF ELECTRICAL MACHINERY
Percent of Total Weight

	1971	1972	1973	1974	1975
Venezuela	5	6	5	5	5
Holland	11	3	2	2	4
Norway	8	9	10	5	8
Other	76	82	83	88	83
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

increased their share while Holland's has declined (Table B).

Exports of electrical machinery increased by more than 200 percent from 1967 to 1975 with positive growth in every year. Major factors responsible for this growth pattern were: U.S. price competitiveness; growth of foreign industrial production; and expansion of Middle Eastern markets.

The projected growth for these exports is similar to that from 1967 to 1973. The upsurge in 1974-75 resulted primarily from large purchases by the oil rich countries. These purchases are reflected in the forecast as an upward shift in the traditional growth path. The forecast is otherwise based on projections of world wholesale prices and industrial production in our major trading partners.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = -51.63 + \underset{(11.35)}{385.64}(\text{Composite Wholesale Prices of Major U.S. Trading Partners}) + \underset{(2.95)}{62.63}(\text{Trade-Weighted Industrial Production for Canada, Japan, and OECD Europe}) - \underset{(-5.86)}{150.19}(\text{U.S. Industrial Production--Electrical Machinery}) + \underset{(.14)}{2.35}(\text{Dummy, 1974-90})$$

$R^2 = .99$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

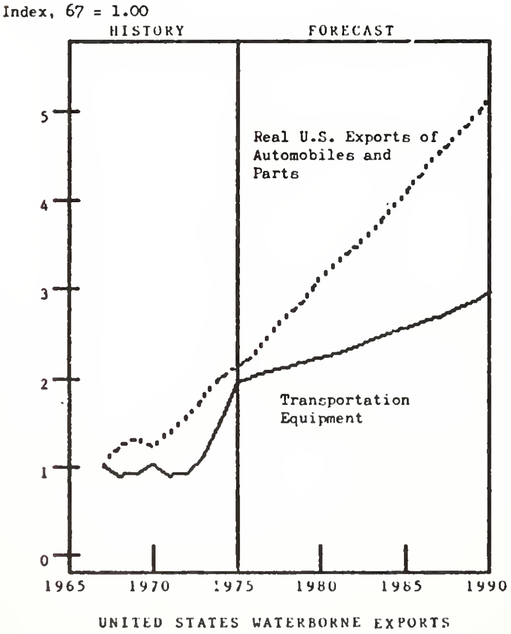
TRANSPORTATION EQUIPMENT

Schedule B Codes: 73 - Transportation equipment which includes: 731 - railway vehicles and parts; 732 - road motor vehicles and parts; 733 - vehicles other than road motor vehicles; 734 aircraft and spacecraft; 735 - ships, boats and floating structures.

Composition: 84 percent 732; 5 percent 731; 7 percent 733; 3 percent 735; and 1 percent 734.

Description: In 1975 transportation equipment accounted for 0.4 percent of total U.S. waterborne exports. 27 to 18 percent of total U.S. transportation equipment exports were carried by vessel from 1967 to 1975 (Table A). Major markets for the waterborne share in 1975 were: Iran (14 percent), Venezuela (8 percent), and Australia (3 percent). Iran has increased her share from only 4 percent in 1971 (Table B).

After some ups and downs (1967-1972) waterborne exports of transportation equipment boomed from 1973 to 1975. Devaluation as well as strong demands from the OPEC countries were the main factors responsible for the surge, and their



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	642.4	-	27
H#	1968	567.4	-11.7	20
I	1969	580.2	2.3	19
S	1970	656.4	13.1	22
T	1971	569.4	-13.2	18
O	1972	580.5	2.0	19
R	1973	721.3	24.3	18
Y	1974	960.0	33.1	19
	1975	1241.9	29.4	24
F				
O				
R	1980	1424.0	2.8	-
E	1985	1641.3	2.9	-
C	1990	1897.8	2.9	-
A	1995	2190.9	2.9	-
S	2000	2529.3	2.9	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705. FT 450. "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF TRANSPORTATION MACHINERY
Percent of Total Weight

	1971	1972	1973	1974	1975
Venezuela	9	8	8	7	8
Australia	5	5	5	6	3
Iran	4	3	3	5	14
Other	82	87	84	82	75
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

favorable effects will likely be felt through the 70's. Moreover, the production of smaller cars with lower gasoline consumption has helped U.S. exports in recent years.

It is forecast by DRI that total (all modes) exports of automobiles and parts will continue to grow in line with the past trend. Nearly 80 percent of these exports will be shipped overland to Canada, Mexico and other South American countries. In the future, however, U.S. direct investment in production facilities in noncontinguous, remote countries to avoid transportation costs and import duties will dampen waterborne export growth. As a result of this consideration, it is forecast that waterborne exports of transportation equipment will grow at a moderate rate of 2.9 percent per year throughout the forecast horizon.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = \underset{}{222.74} + \underset{(2.75)}{109.27}(\text{Real U.S. Exports of Motor Vehicles and Parts}) + \underset{(2.91)}{370.72}(\text{Dummy, 1975-90}) \qquad R^2 = .87$$

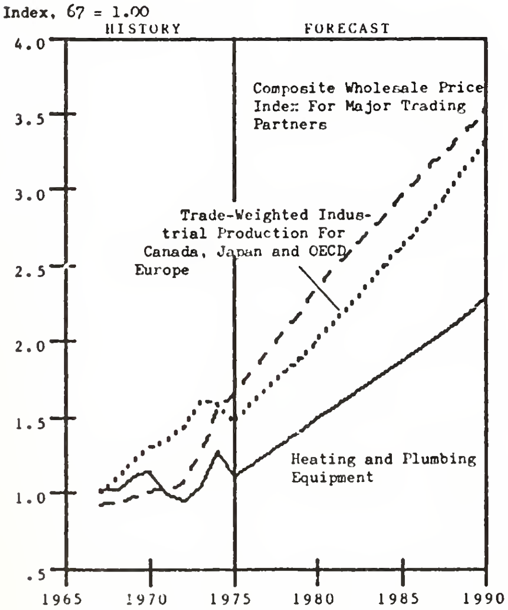
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

HEATING AND PLUMBING EQUIPMENT

Schedule B Code: 812

Description: Exports of heating and plumbing constituted a negligible share of total U.S. export tonnage in 1975 (Table A). Exports are also distributed to wide geographical areas of the world (Table B).

The nine-year history does not offer a clear picture of growth in export tonnage, but the annual fluctuations paralleled closely with those of wholesale prices and industrial production. Based on projections of these variables moderate growth of over 4 percent per year is expected in the future.



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	21.0	-	49
H#	1968	21.3	1.4	51
I	1969	23.1	8.5	50
S	1970	24.0	3.5	55
T	1971	20.8	-13.3	48
O	1972	19.8	-4.5	45
R	1973	22.2	11.8	43
Y	1974	26.7	20.4	46
	1975	23.3	-12.7	47
F				
O				
R	1980	31.4	6.1	-
E	1985	39.4	4.7	-
C	1990	48.4	4.2	-
A	1995	60.1	4.4	-
S	2000	74.6	4.4	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF HEATING AND PLUMBING EQUIPMENT
Percent of Total Weight

	1971	1972	1973	1974	1975
Dominican Republic	5	7	7	9	7
Holland	12	6	7	5	3
Germany	9	7	9	5	3
Japan	5	4	8	6	4
Other	69	76	69	75	86
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

Forecast from 1976 to 1990 based on the following equation:
Exports = 139.19 + 14.97(Composite Wholesale Prices of Major Trading Partners)
(2.70)
-2.19(Time) + 16.13(Trade-Weighted Industrial Production for Canada, Japan
(-2.11) (1.82)
and OECD Europe)

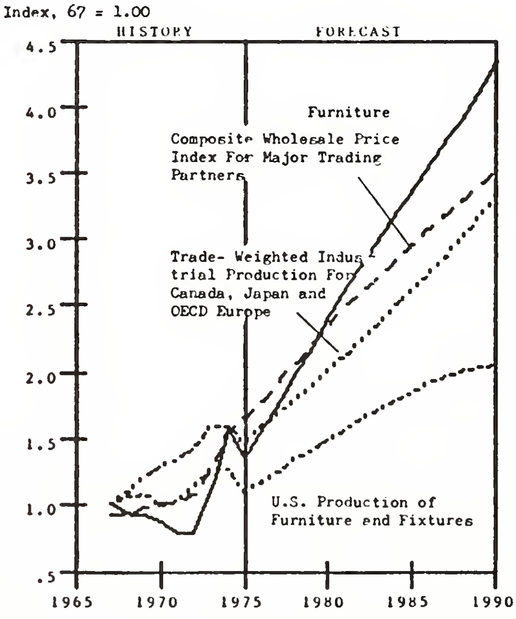
$R^2 = .67$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

FURNITURE

Schedule B Code: 821.

Description: The major portion of furniture exports goes to Canada and Mexico on inland routes and about 30 percent of total exports are by water (Table A). They were shipped to such countries as Saudi Arabia and the Bahamas, accounting for 17 percent and 9 percent respectively of total waterborne U.S. furniture exports in 1975 (Table B).

During the first five years of history (1967-72), the trade volume of furniture experienced a gradual decline, but registered sudden gains in 1973 and 1974, but dipped again in 1975. All in all, there was a slight gain over the nine year period. The general pattern of fluctuations for



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	17.6	-	50
H#	1968	16.5	-6.2	46
I	1969	16.2	-2.1	47
S	1970	15.4	-4.7	46
T	1971	13.9	-9.9	43
O	1972	13.9	-0.0	36
R	1973	19.8	42.9	37
Y	1974	27.6	39.1	34
	1975	23.7	-14.1	33
F				
O				
R	1980	42.1	12.2	-
E	1985	59.0	7.0	-
C	1990	76.3	5.3	-
A	1995	102.6	6.1	-
S	2000	138.1	6.1	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE FURNITURE EXPORTS
Percent of Total Weight

	1971	1972	1973	1974	1975
Bahamas	24	20	15	11	9
Saudi Arabia	11	4	8	7	17
Other	65	76	77	82	74
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

furniture exports, however, followed patterns of U.S. production of furniture and fixtures, and industrial production (as an index of economic activity and income) abroad. In light of continued growth in these variables and prices, the exports of furniture are forecast to grow at annual rates of 12.2 percent to 1980; 7 percent between 1980 and 1985; and at somewhat reduced rates of 5 to 6 percent thereafter. The 1990 tonnage, estimated at 76 thousand tons, will be 3 times, and the 2000 tonnage of 138 thousand tons will be 6 times the 1975 level.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 213.96 + \underset{(1.21)}{14.97}(\text{U.S. Industrial Production--Furniture and Fixtures}) + \underset{(21.45)}{35.48}(\text{Composite Wholesale Price Index of Major U.S. Trading Partners}) + \underset{(6.17)}{21.46}(\text{Trade-Weighted Industrial Production for Canada, Japan and OECD Europe}) - \underset{(-11.55)}{3.79}(\text{Time})$$

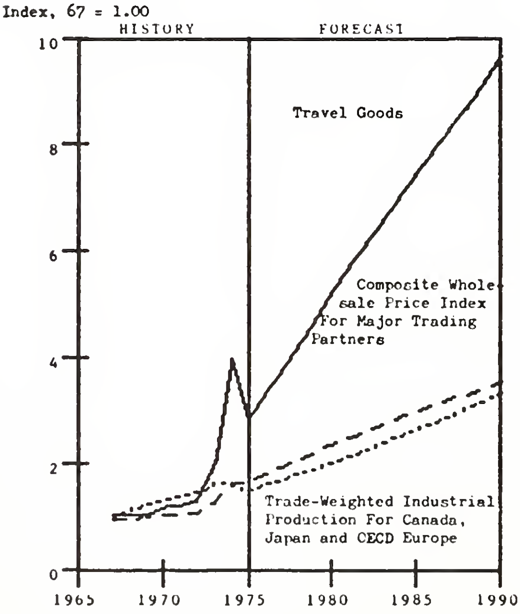
$R^2 = .99$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

TRAVEL GOODS

Schedule B Code: 831.

Description: An extremely small volume (3,200 tons in 1975) of travel goods was exported via water to such countries as Saudi Arabia, Singapore, Belgium and Luxembourg, Hong Kong, and Kuwait (Table B). Nonetheless the volume of exports increased over the nine-year history from 1,100 tons in 1967 to 3,200 tons in 1975 (Table A). In light of the fact that these categories are labor intensive goods, it may seem paradoxical that exports of these goods gained some ground abroad. The strength of these exports, however, may be in speciality items. Even though surprises for these export categories cannot be ruled out, exports are expected to grow to 10,900 tons by 1990 and 20,300 tons by 2,000.



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	1.1	-	48
	1968	1.2	2.3	48
	1969	1.1	-1.6	49
	1970	1.3	14.9	57
	1971	1.3	0.5	53
	1972	1.5	10.4	45
	1973	2.3	55.7	41
	1974	4.5	98.3	55
	1975	3.2	-29.2	52
FORECAST	1980	5.9	13.0	-
	1985	8.4	7.4	-
	1990	10.9	5.5	-
	1995	14.9	6.4	-
	2000	20.3	6.4	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS, SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF TRAVEL GOODS
Percent of Total Weight

	1971	1972	1973	1974	1975
Saudi Arabia	-	1	1	5	15
Singapore	9	7	13	12	10
Belgium & Luxembourg	14	13	7	5	7
Hong Kong	10	13	11	7	5
Kuwait	3	6	5	8	9
Other	64	63	63	63	54
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

Forecast from 1976 to 1990 based on the following equation:

Exports = 10.24 - .22(Time) + 3.98(Composite Wholesale Prices of Major U.S.
(10.77)
Trading Partners) + 1.93(Trade-Weighted Industrial Production for Canada, Japan,
(3.56)
and OECD Europe) + 1.26 (Dummy, 1974)

$R^2 = .99$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

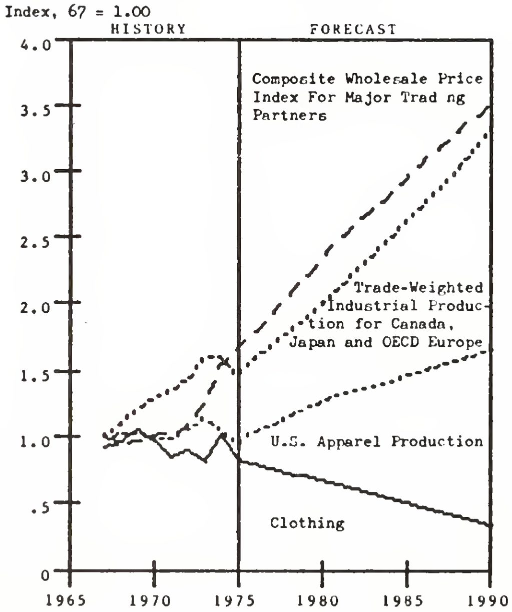
CLOTHING

Schedule B Codes: 84 - clothing which includes: 841 - clothing except fur; 842 - fur clothing.

Composition: virtually all 841.

Description: The exports of clothing seem to be the weakest U.S. export in the consumer's goods category. In fact, a substantial portion of the export tonnage is clothing for relief to countries such as India, Chile, Brazil, Israel and many other countries of the world (Table B).

The export tonnage of clothing fell from slightly less than 25 thousand tons in 1967 to 20 thousand tons in 1975 (Table A), a 20 percent drop in nine years. Considering the dollar devaluation which took place in this period, the performance



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	24.6	-	61
H#	1968	23.9	-2.7	57
I	1969	25.7	7.7	55
S	1970	23.7	-8.0	53
T	1971	20.8	-12.1	44
O	1972	22.1	6.2	40
R	1973	20.0	-9.7	32
Y	1974	25.0	25.0	32
	1975	20.5	-17.7	28
F				
O				
R	1980	16.5	-4.3	-
E	1985	12.5	-5.4	-
C	1990	8.3	-7.9	-
A	1995	5.9	-6.7	-
S	2000	4.1	-6.7	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705. FT 450. "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE CLOTHING EXPORTS
Percent of Total Weight

	1971	1972	1973	1974	1975
Belgium & Luxembourg	18	22	5	4	2
Brazil	6	4	5	3	3
Other	76	74	90	93	95
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

of clothing exports was dim indeed. With increasing competition from clothing manufacturers in Asian countries, the prospects for the future are unfavorable as ever. It is forecast, therefore, that the export tonnage will continue to decline in the future.

Forecast from 1976 to 1990 based on the following equation:
Exports = 66.66 + 0.92(Composite Wholesale Price Index of Major U.S. Trading Partners) - 2.31(Trade-Weighted Industrial Production for Canada Japan and OECD Europe) - 1.32(U.S. Industrial Production--Apparel) - 0.57(Time) + 4.52(Dummy, 1974)

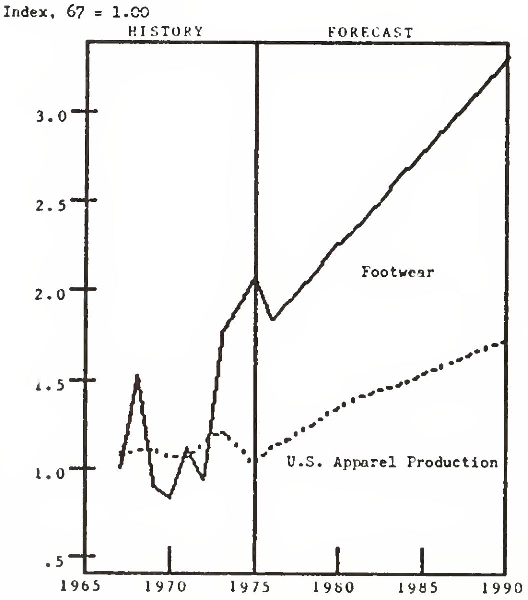
$R^2 = .76$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

FOOTWEAR

Schedule B Code: 851.

Description: With a mere 1,800 tons, waterborne exports of footwear are an extremely insignificant trade item. Major countries of destination for waterborne footwear exports are Japan (15 percent), South Africa (11 percent) and Bahamas (6 percent) (Table B).

During the nine-year history (1967-75), there were considerable ups and downs in the export volume but all in all it registered a growth trend (Table A). The forecast is based on a relationship between footwear exports and the U.S. apparel production. It is forecast that the export tonnage will, after a set back in 1976, grow at an annual average rate of 4 percent.



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
HISTORY#	1967	0.9	-	0
	1968	1.3	52.4	0
	1969	0.8	-41.8	0
	1970	0.7	-6.8	0
	1971	1.0	34.0	0
	1972	0.8	-16.3	0
	1973	1.5	87.9	0
	1974	1.6	8.8	0
	1975	1.8	9.1	0
FORECAST	1980	1.9	1.7	-
	1985	2.4	4.3	-
	1990	2.8	3.5	-
	1995	3.5	3.9	-
	2000	4.2	3.9	-

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE FOOTWARE EXPORTS

Percent of Total Weight

	1971	1972	1973	1974	1975
Bahamas	8	11	8	7	6
Japan	7	11	21	23	15
South Africa	5	4	11	10	11
Netherlands Antilles	7	10	4	3	1
Other	73	64	56	57	67
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, *U.S. Exports*

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = -5.36 - \underset{(-001)}{.01}(\text{U.S. Industrial Production--Apparel}) + \underset{(1.75)}{0.09}(\text{Time}) + \underset{(0.55)}{0.24}(\text{Dummy, 1974})$$

$R^2 = .50$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

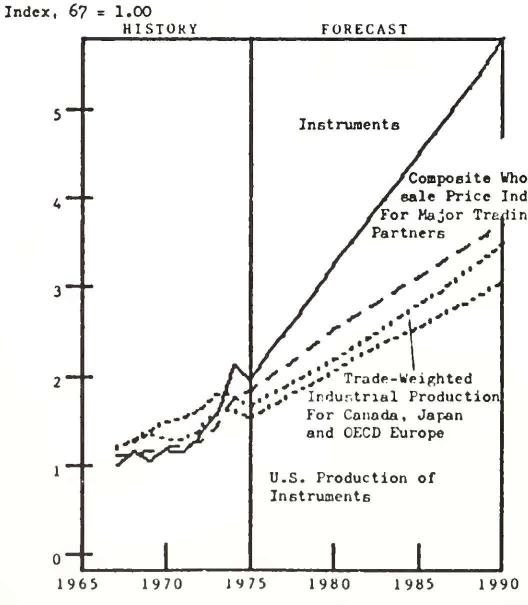
INSTRUMENTS

Schedule B Codes: 86 - instruments which includes: 861 - scientific and medical apparatus nec.; 862 - photographic supplies; 863 - motionpicture and photo film; 864 - watches, clocks and parts thereof.

Composition: 58 percent 862; 41 percent 861; 1 percent 864; and negligible amounts of 863.

Description: Instruments, mainly consisting of photographic, cinematographic, and optical instruments and supplies, constitute .04 percent of U.S. waterborne export tonnage in 1975. The major importers were Japan which received 13 percent of all waterborne exports in 1975, and Germany (9 percent), England (6 percent), Italy (6 percent) and Holland (6 percent) (Table B).

Until 1972, there was virtual stagnation in the export tonnage of this category. But in the subsequent three years the tonnage grew and reached the level of 107.4 thousand tons in 1974. The volume, however, dipped slightly in 1975 (Table A).



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	51.0	-	38
H#	1968	58.0	13.7	38
I	1969	52.7	-9.2	34
S	1970	59.5	12.9	37
T	1971	58.1	-2.3	34
O	1972	66.0	13.6	34
R	1973	79.7	20.8	35
Y	1974	107.4	34.7	36
	1975	98.3	-8.5	36
F				
O				
R	1980	165.3	11.0	-
E	1985	229.2	6.8	-
C	1990	296.3	5.3	-
A	1995	396.6	6.0	-
S	2000	530.9	6.0	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705, FT 450, "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF INSTRUMENTS
Percent of Total Weight

	1971	1972	1973	1974	1975
Japan	6	14	14	14	13
Germany	9	10	10	8	9
England	6	6	6	6	6
Italy	7	7	7	5	6
Holland	6	7	6	6	5
Other	66	56	57	61	61
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

Notwithstanding the severe competition from Japan and other suppliers of photographic and cinematographic equipments and supplies, the rapid development of instant cameras and other technological innovations in this category have caused the sudden upsurge for U.S. exports.

The forecast calls for continuation of growth experienced in recent years under the assumption that the economy of the U.S. and the rest of the world will be stabilized and will continue to grow. The tonnage is expected to triple by 1990 reaching the level of 296 thousand tons and as high as 530 thousand tons in 2,000. These forecasts presuppose continued technological leadership on the part of the United States in the develpment and production of these goods.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 366.29 + \underset{(1.42)}{74.29}(\text{Trade-Weighted Industrial Production for Canada, Japan and OECD Europe}) + \underset{(3.22)}{98.26}(\text{Composite Wholesale Price Index of Major U.S. Trading Partners}) - \underset{(-0.28)}{13.33}(\text{U.S. Industrial Production--Instruments}) - \underset{(-1.56)}{6.94}(\text{Time})$$

$R^2 = .95$

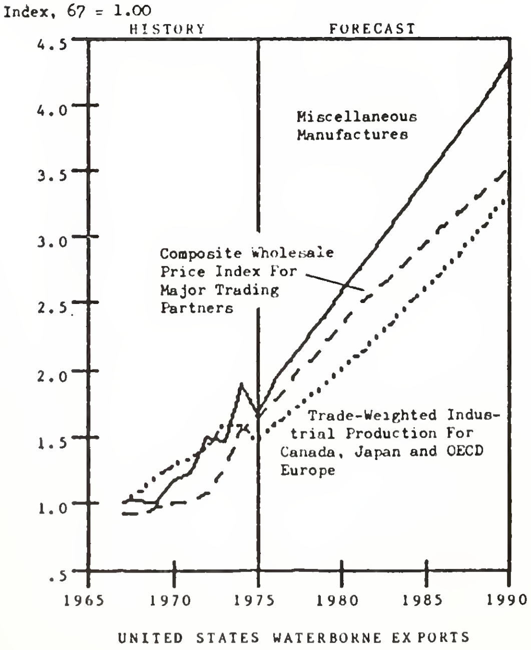
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

MISCELLANEOUS MANUFACTURES

Schedule B Codes: 89 - miscellaneous manufactures which includes: 891 - sound recorders and parts; 892 - printed matter; 893 - plastic manufactures nec.; 894 - baby carriages, toys and games; 895 - office and stationary supplies; 896 - works of art; 897-jewelry and related articles; 899 - manufactured articles nec..

Composition: 34 percent 892; 30 percent 893; 19 percent 894; 10 percent 891; 4 percent 899; and 3 percent 895.

Description: Miscellaneous manufactured goods, mostly photographic and printed matrials, were exported to England (11 percent), Germany (6 percent), Japan (8 percent) and Australia (10 percent) (Table B). All these countries imported from the U.S. a sizeable volume of phonographic and sound media instruments and supplies. In addition, the English-speaking countries, England and Australia imported a large quantity of printed materials



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	122.3	-	41
H#	1968	125.9	3.0	39
I	1969	122.9	-2.3	36
S	1970	144.2	17.3	41
T	1971	150.1	4.2	38
O	1972	183.8	22.4	39
R	1973	179.8	-2.1	34
Y	1974	230.8	28.4	34
	1975	204.6	-11.4	35
F				
O				
R	1980	315.5	9.0	-
E	1985	419.2	5.9	-
C	1990	528.9	4.8	-
A	1995	684.8	5.3	-
S	2000	886.7	5.3	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705. FT 450. "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE
EXPORTS OF MISCELLANEOUS MANUFACTURED
Percent of Total Weight

	1971	1972	1973	1974	1975
England	9	9	12	11	11
Germany	7	5	6	5	6
Japan	23	31	14	11	8
Australia	7	7	10	11	10
Other	54	48	58	62	35
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

from the United States. Because Canada is also a large market for U.S. goods, the percentage of waterborne shipments has been relatively small (Table A).

During the nine-year history (1967-75), in spite of annual ups and downs, the tonnage grew at annual compound rate of 5 to 6 percent. It is expected that this growth rate will continue in the future doubling the trade volume every 10 years.

Forecast from 1976 to 1990 based on the following equation:

$$\text{Exports} = 15.10 - \underset{(-.11)}{1.07}(\text{Time}) + \underset{(1.12)}{96.45}(\text{Trade-Weighted Industrial Production for Canada, Japan, and OECD Furope}) + \underset{(1.52)}{82.23}(\text{Composite Wholesale Prices for Major U.S. Trading Partners})$$

$R^2 = .91$

Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

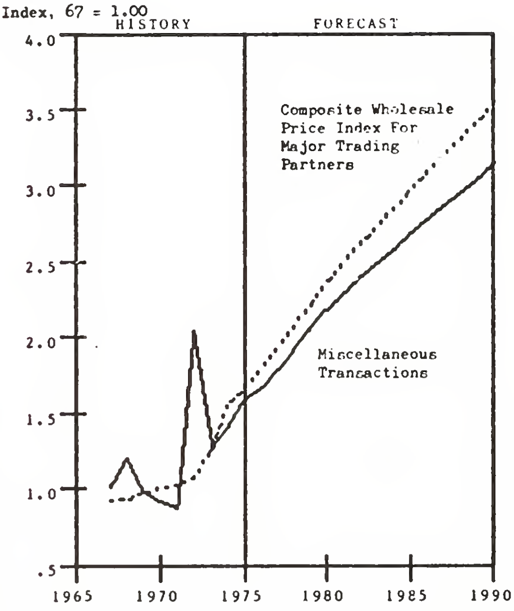
MISCELLANEOUS GOODS NEC.

Schedule B Codes: 9 - miscellaneous goods nec. which includes: 941 - live animals nec.; 961 - coins except gold.

Composition: virtually all 961.

Description: Very small quantities, 17,500 tons in 1975, are classified as commodities and transactions not classified according to kind, and military goods.

In 1975, the total export value was $3.2 billion, $1.4 billion of which consisted of defense shipments. Of the $1.8 billion civilian shipments only $420 million were waterborne.



UNITED STATES WATERBORNE EXPORTS

Table A

	YEAR	000 LT	ANNUAL % GR	% WATER-BORNE*
	1967	11.0		8
H#	1968	13.2	19.7	9
I	1969	10.7	-19.2	9
S	1970	10.1	-5.3	13
T	1971	9.6	-5.5	12
O	1972	22.4	134.8	12
R	1973	13.9	-38.0	14
Y	1974	15.5	11.5	14
	1975	17.5	13.1	13
F				
O				
R	1980	23.9	6.4	-
E	1985	29.4	4.2	-
C	1990	34.5	3.3	-
A	1995	41.5	3.7	-
S	2000	49.9	3.7	-
T				

* BASED ON DOLLAR VALUE.
# SOURCE: BUREAU OF THE CENSUS. SA 705. FT 450. "U.S. EXPORTS".

Table B

MAJOR COUNTRIES OF DESTINATION FOR WATERBORNE EXPORTS OF MISCELLANEOUS GOODS N.E.C.
Percent of Total Weight

	1971	1972	1973	1974	1975
Denmark	6	4	6	6	5
India	16	3	3	6	9
Bangladesh	-	39	8	2	4
Philippines	9	4	15	2	9
Other	69	50	68	84	73
Total	100	100	100	100	100

Source: U.S. Bureau of Census, SA 705, U.S. Exports

Since 1967, the shipments of miscellaneous goods hardly grew. But in 1972, the tonnage doubled due to shipments to Bangladesh in response to the Pakistan-Bangladesh incident.

Since little can be anticipated for the future, time and a price variable were used for the forecast, yielding a long term growth rate of 3 to 5 percent.

Forecast from 1976 to 1990 based on the following equation:
Exports = 43.19 + 14.68(Composite Wholesale Price Index of Major U.S.
(3.10)
Trading Partners) - 0.67(Time) + 11.85(Dummy, 1972)
(-1.40) (6.87)

$R^2 = .94$
Forecast from 1990 to 2000 based on 1980 to 1990 growth rate.

APPENDICES

Appendix A

DEFINITIN OF WORLD REGIONS AND COUNTRIES

The following is a list of those countries within the nineteen regions for which the foreign trades at 3-digit level have been allocated. The regions are shown with their code number used in the computer. The countries are shown with their Schedule C number.

Region 00 United States

100	United States
903	Puerto Rico
911	Virgin Islands
931	Midway Island
933	Wake Island
935	Guam
941	Canton and Enderbury Islands
951	American Samoa

Region 01 Canada

122	Canada

Region 02 Eastern South America

301	Colombia
307	Venezuela
351	Brazil
353	Paraguay
355	Uruguay
357	Argentina

Region 03 Western South America

331	Ecuador
333	Peru
335	Bolivia
337	Chile

Region 04 Caribbean

161	Miquelon and St. Pierre Islands
232	Bermuda
236	Bahamas
239	Cuba
241	Jamaica
242	*Jamaica

2

Region 04 Caribbean (continued)

243	Turks and Caicos Islands
244	Cayman Islands
245	Haiti
247	Dominican Republic
248	Antigua
248	British Virgin Islands
248	Dominica
248	Grenada
248	Leeward and Windward Islands
248	Montserrat
248	St. Christopher-Nevis-Anguilla
248	St. Vincent
248	St. Lucia
272	Barbados
274	Trinidad and Tobago
277	Netherlands Antilles
283	French West Indies
312	Guyana
315	Surinam
317	French Guiana
372	Falkland Islands

Region 05 Central America

205	Guatemala
208	Belize
211	El Salvador
215	Honduras
219	Nicaragua
223	Costa Rica
225	Panama
227	Canal Zone

Region 06 Mexico

201	Mexico

Region 07 Northern Europe

101	Greenland
400	Iceland
401	Sweden
403	Norway
405	Finland
409	Denmark
419	Ireland
421	Netherlands (Holland)

Appendix A -- cont.

Region 07 Northern Europe (continued)

423	Belgium and Luxembourg
427	France
428	Federal Republic of Germany
433	Austria
441	Switzerland

Region 08 Mediterranean Europe

467	Azores
469	Spain
471	Portugal
472	Gibraltar
473	Malta and Gozo
475	Italy
479	Yugoslavia
484	Greece
489	Turkey

Region 09 United Kingdom

412	United Kingdom

Region 10 North Africa

714	Morocco
721	Algeria
723	Tunisia
725	Libya

Region 11 Developing Africa

733	Canary Islands
736	Spanish Africa, N.E.C.
736	Spanish Sahara
736	Spanish Africa, N.E.C.
738	Equatorial Guinea
740	*Spanish Africa, N.E.C.
741	Mauritania
742	Cameroon
744	Senegal
745	Mali
746	Guinea
747	Sierra Leone

Appendix A -- cont.

4

748	Ivory Coast
749	Ghana
750	The Gambia
751	Niger
752	Togo
753	Nigeria
754	Central African Republic
755	Gabon
756	Chad
757	*Western Africa, N.E.C.
758	St. Helena
759	Maderia Islands
760	Upper Volta
761	Benin (Dahomey)
762	Angola
763	Congo (Brazzaville)
764	Cape Verde
764	Guinea-Bissau
764	Sao Tome and Principe
764	Western Africa, N.E.C.
765	Liberia
766	Zaire
767	Burundi
768	*Burundi and Rwanda
769	Rwanda
770	Somalia
774	Ethiopia
777	Afars and Issas
778	Uganda
779	Kenya
780	Seychelles
781	British Indian Ocean Territory
782	*Seychelles and Dependencies
783	Tanzania
784	*Mautitius and Dependencies
785	Mauritius
787	Mozambique
788	Malagasy Republic
789	*Malagasy Republic
790	Comoro Islands
790	French Indian Ocean Areas
792	South-West Africa (Namibia)
793	Botswana

5

Region 11 Developing Africa (continued)

794	Zambia
795	Swaziland
796	Rhodesia
797	Malawi
798	*Southern Africa, N.E.C.
799	Lesotho

Region 12 Republic of South Africa

791	Republic of South Africa

Region 13 Middle East

491	Cyprus
502	Syria
504	Lebanon
505	Iraq
507	Iran
508	Israel
511	Jordan
512	Gaza Strip
513	Kuwait
517	Saudi Arabia
518	Qatar
519	*Arabia Penins. States, N.E.C.
520	United Arab Emirates
521	Yemen (Sana)
522	Yemen (Aden)
523	Oman
525	Bahrain
729	Egypt
732	Sudan

Region 14 Japan

588	Japan
590	*Nansei Islands (inc. Okinawa)

Region 15 East Asia

546	Burma
549	Thailand
557	Malaysia
559	Singapore
560	Indonesia

6

Region 15 East Asia (continued)

561	Brunei
565	Philippines
566	Macao
567	*South and S.E. Asia, N.E.C.
568	Bhutan
568	Maldive Islands
568	Portuguese Timor
568	Southern Asia, N.E.C.
580	Republic of Korea
582	Hong Kong
583	Republic of China (Taiwan)
604	Papua New Guinea
620	*British West Pacific Islands
622	British Pacific Islands
622	Gilbert and Ellice Islands
622	New Hebrides
622	Pitcairn Island
622	Solomon Islands
641	French Pacific Islands
641	French Polynesia
641	New Caledonia
641	Wallis and Futuna
684	Trust Territory of the Pacific
686	Fiji
686	Nauru
686	Other Pacific Islands, N.E.C.
686	Tonga

Region 16 South Asia

531	Afghanistan
533	India
535	Pakistan
536	Nepal
538	Bangladesh
542	Sri Lanka (Ceylon)

Region 17 Communist Asia

550	North Vietnam
551	South Vietnam
553	Laos
555	Cambodia
570	Peoples Republic of China
574	Mongolia
579	North Korea

7

Region 18 Communist Europe

429	German Democratic Republic
435	Czechoslovakia
437	Hungary
447	Estonia
449	Latvia
451	Lithuania
455	Poland
461	Union of Soviet Socialist Rep.
481	Albania
485	Romania
487	Bulgaria

Region 19 Australia and Oceania

602	Australia
602	Australia
602	Christmas Island
602	Cocos (Keeling) Islands
602	Heard and McDonald Islands
602	Norfolk Island
612	*New Zealand and Western Samoa
614	Cook Islands
614	New Zealand
614	Niue
614	Tokelau Islands
615	Western Samoa

Appendix B

DEFINITION OF TRADE ROUTES AND COASTAL DISTRICTS

B-1

TRADE ROUTE NUMBER	DESCRIPTION
1	Atlantic/East Coast South America
2	Atlantic/West Coast South America
4	Atlantic/Caribbean (Incl. Cristobal), East Coast Mexico
5,7,8,9,	North Atlantic/United Kingdom, and Ireland, Germany (North Sea), Belgium, Netherlands, Atlantic France and Spain (North of Portugal)
6	North Atlantic/Scandinavian and Baltic Ports (including Newfoundland)
10	North Atlantic/Mediterranean, Black Sea, Portugal, Spain (South of Portugal), Morocco and Azores
11	South Atlantic/United Kingdom, Continental Europe North of Portugal
12	Atlantic/Far East
13	South Atlantic and Gulf/Mediterranean, Black Sea, Portugal, Spain (South of Portugal), Morocco and Azores
4.(14-1)	Atlantic (Service 1)/West Africa, Canary Is., Cape Verde Is., and Madiera Is.
42(14-2)	Gulf (Service 1)/West Africa, Canary Is., Cape Verde Is., and Madiera Is.
43(14-3)	Pacific/West Africa, Canary Is., Cape Verde Is., and Madiera Is.
51(15-A)	Atlantic/South and East Africa, Malagasy Rep., British West Africa, St. Helena, Ascension Is.
52(15-B)	Gulf/South and East Africa, Malagasy Rep., British West Africa, St. Helena, Ascension Is.
53(15-)	Pacific/South and East Africa, Malagasy Rep., British West Africa, St. Helena, Ascension Is.
16	Gulf, Atlantic/Australasia
17	Atlantic, Gulf, Pacific/Indonesia, Malaysia, Singapore
18	Atlantic, Gulf/India, Persian Gulf, Red Sea, Pakistan, Sri Lanka, Burma Bangladesh
19	Gulf/Caribbean (Incl. Cristobal), East Coast of Mexico
20	Gulf/East Coast South America
21	Gulf/United Kingdom and Ireland, Continental Europe North of Portugal
22	Gulf/Far East
23	Pacific/Caribbean (Incl. Cristobal), East Coast Mexico
24	Pacific/East Coast South America
25	Pacific/West Coast South America, Central America and Mexico, Balboa
26	Pacific, Hawaii, Alaska/United Kingdom and Ireland, Continetal Europe North of Portugal
65(26-C)	Pacific,/Mediterranean
27	Pacific, Hawaii/Australasia
28	Pacific/Burma, Sri Lanka, India, Pakistan, Persian Gulf of Aden, Red Sea, Bangladesh
29	Pacific, Hawaii, Alaska/Far East
31	Gulf/West Coast South America

TRADE ROUTE NUMBER	DESCRIPTION
32	Great Lakes/United Kingdom and Ireland, Continental Europe North of Portugal
33	Great Lakes/Caribbean (Incl. Cristobal), East Coast Mexico
34	Great Lakes/Mediterranean, Black Sea, Portugal, Spain (South of Portugal), Morocco
35	Atlantic/Canadian Great Lakes
36	Gulf/Canadian Great Lakes
37	California/Canadian Great Lakes
38	Washington, Oregon/Canadian Great Lakes
54	Great Lakes/West Africa
55	Great Lakes/South and East Africa
56	Great Lakes/Red Sea, India, Persian Gulf, Indonesia, Malaysia, Singapore
57	Round-the-World
58	Great Lakes/Pacific Canada
59	Great Lakes/Far East
60	Great Lakes/Australasia
71	Atlantic/West Coast Central America and Mexico
72	Gulf/West Coast Central America and Mexico
77	Atlantic/Pacific Canal Zone
78	Gulf/Pacific Canal Zone
80	Great Lakes/West Coast South America, Central America and Mexico
81	Atlantic/Atlantic Canada
82	Gulf/Atlantic Canada
83	Pacific/Atlantic Canada
84	Great Lakes/East Coast South America
85	Atlantic/Pacific Canada
86	Gulf/Pacific Canada
87	Pacific/Pacific Canada
89	Great Lakes/Atlantic Canada
91	Puerto Rico/Foreign-Virgin Island/Foreign
92	Hawaii/Foreign (Except T.R. - 26, 27 and 29)
93	Alaska/Foreign (Except T.R. - 26 and 29)
61	U.S. Great Lakes/Canada Great Lakes

Essential Routes

1 through 14-2
15-A and 15-B
16 through 26
27 through 34

Appendix B -- cont.

B-2

U.S. TRADE ROUTES DEFINED BY FOREIGN PORTS AND U.S. COASTAL DISTRICTS

Foreign Ports		Trade Routes (Determined by Coastal District)								
					Coastal Districts					
K Codes	Location	No. Atl. 1	So. Atl. 2	Gulf 3	Calif. 4	Wash. Oreg. 5	Great Lakes 6	VI P/R 9	Haw. 7	Alas. 8
01822	Montreal	81	81	82	83	83	61*	91	92	93
01000-09999	(exc. 01822) Great Lakes	35	35	36	37	38	61*	91	92	93
10100-10177	Greenland	06	11	21	26	26	32	91	92	93
12200-12497	Canada (Pacific)	85	85	86	87	87	58	91	92	93
13400-14499	Canada (Atlantic)	81	81	82	83	83	89	91	92	93
15200-15296	Newfoundland	06	81	82	83	83	89	91	92	93
15298-15299	Labrador	81	81	82	83	83	89	91	92	93
16101	St. Pierre	81	81	82	83	83	89	91	92	93
20100-20146	Mexico, W.C.	71	71	72	25	25	80	91	92	93
20153-20199	Mexico (Gulf or E.C.)	04	04	19	23	23	33	91	92	93
20500-20513	Guat. (Carib.)	04	04	19	23	23	33	91	92	93
20551-20599	Guat. W.C.	71	71	72	25	25	80	91	92	93
20800-20801	Brit. Hond. (Carib.)	04	04	19	23	23	33	91	92	93
21101-21199	El Salvador	71	71	72	25	25	80	91	92	93
21500-21546	Hond. (Carib.)	04	04	19	23	23	33	91	92	93
21551-21599	Honduras (W.C.)	71	71	72	25	25	80	91	92	93
21900-21925	Nicaragua (Carib.)	04	04	19	23	23	33	91	92	93
21951-21999	Nicaragua (W.C.)	71	71	72	25	25	80	91	92	93
22300-22313	C. Rica (Carib.)	04	04	19	23	23	33	91	92	93
22363-22399	C. Rica (W.C.)	71	71	72	25	25	80	91	92	93
22500-22519	Panama (Carib.)	04	04	19	23	23	33	91	92	93
22577-22599	Panama (W.C.)	71	71	72	25	25	80	91	92	93
22700-22718	Canal Zone (Carib.)	04	04	19	23	23	33	91	92	93
22701-23251-22799	Canal Zone (W.C.)	77	77	78	25	25	80	91	92	93
23201-23251-23299	Bermuda	04	04	19	23	23	33	91	92	93

Appendix B -- cont. (B-2 -- cont.)

Foreign Ports		Trade Routes (Determined by Coastal District)								
					Coastal Districts					
K Codes	Location	No. Atl. 1	So. Atl. 2	Gulf 3	Calif. 4	Wash. Oreg. 5	Great Lakes 6	VI P/R 9	Haw. 7	Alas. 8
23600-23661	Bahamas	04	04	19	23	23	33	91	92	93
23900-24791	Cuba, Jamaica, Haiti, D.R.	04	04	19	23	23	33	91	92	93
24800-27451	L&W Islds. Barb. Trin. & Tob.	04	04	19	23	23	33	91	92	93
27700-27799	N. Antilles	04	04	19	23	23	33	91	92	93
28300-28399	Guad. & Mart.	04	04	19	23	23	33	91	92	93
30100-30145	Colombia (Carib.)	04	04	19	23	23	33	91	92	93
30151-30163-30199	Colombia (W.C.)	02	02	31	25	25	80	91	92	93
30198	Colombia (Amazon River)	01	01	20	24	24	84	91	92	93
30700-30782	Venezuela	04	04	19	23	23	33	91	92	93
31200-31700	Guianas & Surinam	04	04	19	23	23	33	91	92	93
33100-33161	Ecuador	02	02	31	25	25	80	91	92	93
33300-33335	Peru	02	02	31	25	25	80	91	92	93
33337	Iquitos, Peru (Amazon River)	01	01	20	24	24	84	91	92	93
33341-33389	Peru	02	02	31	25	25	80	91	92	93
33700-33797	Chile	02	02	31	25	25	80	91	92	93
35107-35795	Brazil-Para-Urug-Arg.	01	01	20	24	24	84	91	92	93
37200	Falkland Is.	01	01	20	24	24	84	91	92	93
40000-40037	Iceland	06	11	21	26	26	32	91	92	93
40100-40976	Swed-Norw-Finland-Denmark	06	11	21	26	26	32	91	26	26
40997	Optional - Denmark	06	11	21	26	26	32	91	26	26
41201-41913	U.K.-Wales-Scot.-Ireld.	05	11	21	26	26	32	91	26	26
42100-42381	Neth. & Belgium	08	11	21	26	26	32	91	26	26
42397	Optional - Belgium	08	11	21	26	26	32	91	26	26
42501	Optional - Neth/Belg.	03	11	21	26	26	32	91	26	26
42502	Optional - Neth/Germ.	08	11	21	26	26	32	91	26	26
42503	Optional - Belg/Germ.	08	11	21	26	26	32	91	26	26
42504	Optional - Neth/Belg/Germ.	08	11	21	26	26	32	91	26	26
42505	Optional - Denmark/Germ.	06	11	21	26	26	32	91	26	26
42700-42762	France (Atl.)	09	11	21	26	26	32	91	26	26
42773-42797	France (Med) Cors. & Mona.	10	13	13	65	65	34	91	92	93
42798	France (Atl.)	09	11	21	26	26	32	91	26	26
42799	France (Medit.)	10	13	13	65	65	34	91	92	93

Appendix B -- cont. (B-2 -- cont.)

Foreign Ports		Trade Routes (Determined by Coastal District)								
					Coastal Districts					
K Codes	Location	No. Atl. 1	So. Atl. 2	Gulf 3	Calif. 4	Wash. Oreg. 5	Great Lakes 6	VI P/R 9	Haw. 7	Alas. 8
42800-42835	W. Germany (Baltic)	06	11	21	26	26	32	91	26	26
42867-42899	W. Germany (Atlantic)	07	11	21	26	26	32	91	26	26
42900-42935	E. Germany	06	11	21	26	26	32	91	26	26
44701-46120	Est-Lith-Pol. & Danz-USSR (Arctic & Baltic)	06	11	21	26	26	32	91	26	26
46121-46150	USSR (Black Sea)	10	13	13	65	65	34	91	92	93
46160-46199	USSR East	12	12	22	29	29	59	91	29	29
46700-46721	Azores	10	13	13	65	65	34	91	92	93
46900-46929	Spain (North of Portugal)	09	11	21	26	26	32	91	26	26
46931-46949	Spain (S.E. of Portugal)	10	13	13	65	65	34	91	92	93
46957-46999	Spain (Medit.)	10	13	13	65	65	34	91	92	93
47100-47145	Portugal	10	13	13	65	65	34	91	92	93
47201-50427	Medit.-Gibraltar thru Lebanon	10	13	13	65	65	34	91	92	93
50500-50751	Iraq-Iran (P.G.)	18	18	18	28	28	56	91	92	93
50800-50801-50805-50845	Israel Medit.	10	13	13	65	65	34	91	92	93
50871	Israel (Eilath) (Red Sea)	18	18	18	28	28	56	91	92	93
51105	Aqaba, Jordon (R.S.)	18	18	18	28	28	56	91	92	93
51300-54601	Kuw-S. Arab-Aden-India-Goa-Damao-Diu, Pak., Sri Lanka,-Burma, Bangladesh	18	18	18	28	28	56	91	92	93
54900-55500	Thailand-V.Nam-Khmer Republic	12	12	22	29	29	59	91	29	29
55700-55759	Malaysia	17	17	17	17	17	56	91	92	93
55900-55976	Singapore	17	17	17	17	17	56	91	92	93
56000-56099	Indonesia	17	17	17	17	17	56	91	92	93
56500-56597	Philippines	12	12	22	29	29	59	91	29	29
56649	Macao, (Port. Terr.)	12	12	22	29	29	59	91	29	29
56769-56799	Southern & Southeastern Asia, N.E.S.	17	17	17	17	17	56	91	92	93
57000-57055	North China & Manch.	12	12	22	29	29	59	91	29	29
57099	All South China	12	12	22	29	29	59	91	29	29

Appendix B -- cont.(B-2 -- cont.)

Foreign Ports		Trade Routes (Determined by Coastal District)								
		Coastal Districts								
K Codes	Location	No. Atl. 1	So. Atl. 2	Gulf 3	Calif. 4	Wash. Oreg. 5	Great Lakes 6	VI P/R 9	Haw. 7	Alas. 8
57900-57919	No. Korea	12	12	22	29	29	59	91	29	29
58000-58035	Rep. of Korea	12	12	22	29	29	59	91	29	29
58097	Optional - Rep. of Korea	12	12	22	29	29	59	91	29	29
58201-58311	Hong Kong-Taiwan	12	12	22	29	29	59	91	29	29
58800-58896	Japan	12	12	22	29	29	59	91	29	29
58897	Optional - Japan	12	12	22	29	29	59	91	29	29
59075	Okinawa	12	12	22	29	29	59	91	29	29
59099	Nansei	12	12	22	29	29	59	91	29	29
60200-64195	Australia & Oceania	16	16	16	27	27	60	91	27	93
68405-68494	Pacific Islands	12	12	22	29	29	59	91	29	29
68628-68699	Other Pacific Isl.	16	16	16	27	27	60	91	27	93
71400-71499	Morocco	10	13	13	65	65	34	91	92	93
72100-72913	Alg.-Tun.-Lib.-Egypt (Med.)	10	13	13	65	65	34	91	92	93
72923-73201	Egypt (Red Sea) & Sudan	18	18	18	28	28	56	91	92	93
73300-73349	Canary Is.	41	41	42	43	43	54	91	92	93
73600-73601	Spanish Africa (Med.) NEC	10	13	13	65	65	34	91	92	93
73800-73850	Equatorial Guinea	41	41	42	43	43	54	91	92	93
74165-75525	Africa (West)	41	41	42	43	43	54	91	92	93
75801-75899	St. Hel. & Asc. Is.	51	51	52	53	53	55	91	92	93
75901-76637	Africa (West)	41	41	42	43	43	54	91	92	93
77000-77001	Berbera, Somali Rep. (No.)	18	18	18	28	28	56	91	92	93
77051-77099	Mogadiscio & Kismayu, Somali Rep. (East)	51	51	52	53	53	55	91	92	93
77405-77701	Asab-Mass Djibouti	18	18	18	28	28	56	91	92	93
77913-79199	S. & E. Africa	51	51	52	53	53	55	91	92	93
91100-91141	Virgin Islands	97	97	97	97	97	97	97	97	97
93500-93501	Guam	96	96	96	96	96	96	96	96	96
95100-95101	American Samoa	95	95	95	95	95	95	95	95	95

* TR 61 Trans Lakes Traffic

T.R. 1 - Atlantic - East Coast South America
30198 - Col. - Amazon River Ports
33337 - Iquitos, Peru
35107-99 - Brazil
35300-01 - Paraguay
35500-35 - Uruguay
35700-95 - Argentina
37200 - Falkland Is.

T.R. 2 - Atlantic - West Coast South America
30151,30163 - Colombia (W.C.)
30199 - Other Col. (W.C.)
33100-61 - Ecuador
33300-89 - Peru (excl. 33337)
33700-97 - Chile

T.R. 4 - Atlantic - Caribbean (incl. Cristobal and East Coast Mexico)
20153-99 - East Coast Mexico
20500-13 - Guatemala (Carib.) E.C.C.A.
20800-01 - British Honduras (Carib.) E.C.C.A.
21500-46 - Honduras (Carib.) E.C.C.A.
21900-25 - Nicaragua (Carib.) E.C.C.A.

22300-13 - Costa Rica (Carib.) E.C.C.A.
22500-19 - Panama (Carib.) E.C.C.A.
22700,22718 - Canal Zone (Carib.)
23201,51,99 - Bermuda
23600-61 - Bahamas, W.I.
23900-91 - Cuba, W.I.

24200-80 - Jamaica, W.I.
24500-91 - Haiti, W.I.
24700-91 - Dominican Republic, W.I.
24800-53 - Leeward Is., W.I.
24871-99 - Windward Is., W.I.

27201-13 - Barbados, W.I.
27400-46 - Trinidad, W.I.
27451 - Tobago, W.I.
27700-99 - Netherlands Antilles
28300-13 - Guadaloupe (Carib.)
28351-99 - Martinique (Carib.)

30100-45 - Colombia (Carib.)
30700-82 - Venezuela (Carib.)
31200-68 - British Guiana
31500-37 - Surinam (Neth. Guiana)
31700 - French Guiana

Appendix B -- cont. (B-3 -- cont.)

T.R. 5 - North Atlantic-United Kingdom and Eire
41200-99 - United Kingdom (West Coast Ports)
41400-85 - Wales
41513-99 - United Kingdom (Channel Ports)
41600-98 - Scotland
41702-99 - United Kingdom (East Coast Ports)
41800-15 - North Ireland
41900-13 - Ireland (Eire)

T.R. 6 - North Atlantic - Scandinavia and Baltic Ports (Incl. Nfld., Greenland and Iceland)
10100-77 - Greenland
15200-96 - Newfoundland
40000-37 - Iceland
40100-99 - Sweden
40300-98 - Norway
40500-87 - Finland
40900-76 - Denmark (Incl. Faros Is.)
40997 - Den. - Optional Ports
42505 - Optional - Denmark & Germany
42800-35 - West Germany (Baltic)
42900-35 - East Germany (Baltic)
44701 - Estonia
44901-51 - Latvia
45101 - Lithuania
45500-09 - Poland
45511-15 - Danzig
45597 - Optional - Poland & Danzig
46100-09 - U.S.S.R. (Arctic)
46113-20 - U.S.S.R. (Baltic)

T.R. 7 - North Atlantic - Germany (North Sea)
42867-99 - West Germany (Atl. Region)

T.R. 8 - North Atlantic - Netherlands & Belgium
42100-90 - Netherlands
42197 - Optional - Netherlands
42300-81 - Belgium
42397 - Optional - Belgium
42501 - Optional - Neth/Belg.
42502 - Optional - Neth/Germ.
42503 - Optional - Belg/Germ.
42504 - Optional - Neth/Belg/Germ.

T.R. 9 - North Atlantic - Atlantic France and North Spain
42700-62 - France (Atl.)
42798 - France (Atl.)
46900-29 - Atl. Spain (North of Portugal)

Appendix B -- cont. (B-3 -- cont.)

T.R. 10 - North Atlantic - Mediterranean & Black Sea - Portugal & Southern Spain - Morocco - Azores

42773-99 - France (Medit.) Incl. Corisica & Monaco
46121-50 - U.S.S.R. (B.S.)
46700-21 - Azores
46931-49 - Spain (Atl. - Southeast of Portugal)
46957-99 - Spain (Medit.)

47100-45 - Portugal (Atl.)
47201 - Gibraltar
47305 - Malta (Valetta)
47500-98 - Itlay

47797 - Optional - Yugo. & Itlay
47900-35 - Yugoslavia
47997 - Optional - Yugo.
48400-75 - Greece
48500-11 - Rumania
48700 - Bulgaria

48900-99 - Turkey (in Asia & Europe)
49133-99 - Cyprus
50200-15 - Syria
50400-27 - Lebanon
50800-45 - Israel (Medit.)

71400-99 - Morocco
72100-95 - Algeria
72197 - Optional - Algeria
72300-73 - Tunisia
72500-95 - Libya
72901-13 - Egypt (Medit.)
73600-01 - Spanish Africa (Medit.) N.E.C.

T.R. 11 - South Atlantic - United Kingdom - Eire & Continental Europe, incl. No. Spain and Scandinavian, Baltic Ports

Same foreign ports as T.R. 5, 6 (excluding Newfoundland), 7, 8, and 9

T.R. 12 - Atlantic - Far East

46160-99 - U.S.S.R. (Eastern Region)
54900-27 - Thailand (Siam)
55000-02 - North Viet Nam
55100-24 - South Viet Nam

T.R. 12 - (Continued)

55500 - Cambodia (Khmer Republic)
56500-97 - Philippine Islands
56649 - Macao (Port. Asia) China

57000-55 - N. China & Manchuria
57099 - S. China
57900-19 - North Korea
58000-35 - Republic of Korea
58097 - Optional - Rep. of Korea
58201 - Hong Kong

58270 - Knowloon
58300-11 - Taiwan (Formosa)
58800-96 - Japan
58897 - Optional - Japan
59075 - Okinawa
59099 - All other Nansei (U.S. Admin.)

68405 - Carolina Is. (W. Pac.)
68465 - Marianas Is. (Saipan) (W. Pac.)
68469 - Marianas Is. (Tinian)
68490 - Marshall Is. (W. Pac.)
68494 - Palau Is. (W. Pac.)

T.R. 13 - South Atlantic/Gulf - Mediterranena, Black Sea, Portugal, So. Spain, Morocco, Azores

Same foreign ports as in T.R. 10

T.R. 14-1 (41) - Atlantic - West Africa/Canary, Cape Verde & Madeira Island

73300-49 - Canary Islands (Spanish)
73800-73846 - Equatiorial Guinea
74165 - Mauritani
74201-98 - Fed. Rep. of Cameroon
74473-99 - Senegal
74619-99 - Guinea
74751-99 - Sierra Leone
74825-99 - Ivory Coast

75041-99 - Gambia
75200-91 - Togo
75300-85 - Nigeria
75397 - Optional - Nigeria
75500-25 - Gabon
75901 - Madeira

T.R. 14-1 (41) (Continued)

76100-76113 - Dahomey
76274-99 - Angola
76300-76350 - Congo (Brazzaville)
76461-99 - Western Port. Africa & Cape Verde Isl.
76500-41 - Liberia
76600-37 - Zaire

T.R. 14-2 (42) - Gulf - West Africa, Canary, Cape Verde & Madeira Is.

Same foreign ports as 14-1 (41)

T.R. 14-3 (43) - Pacific - West Africa, Canary, Cape Verde and Madeira Is.

Same foreign ports as 14-1 (41)

T.R. 15A (51) - Atlantic - South and East Africa and Malagasy Republic and British West Africa, St. Helena & Ascension Is.

75801 - St. Helena
75831 - Ascension Is.
75899 - All other British West Africa Ports
77041,77099 - Somali Republic (Magadiscio & Kismayu)
77913-99 - Kenya
78200 - Seychelles (Victoria)
78351-99 - Tanzania
78401 - Mauritius (Port Louis)
78700-25 - Mozambique
78800-78841 - Malagasy Republic
79000-79070 - Fr. India Ocean Reunion & Comoro Islands
79100-45 - South Africa, Republic Of
79186-99 - S.W. Africa

T.R. 15B (52) - Gulf - South and East Africa, Malagasy Republic, British West Africa, St. Helena and Ascension Is.

Same foreign ports as T.R. 15A (51)

T.R. 15C (53) - Pacific - South and East Africa, Malagasy Republic, British West Africa, St. Helena and Ascension Is.

Same foreign ports as T.R. 15A (51)

T.R. 16 - Atlantic & Gulf - Australia, New Zealand, New Guinea & S. Sea Is.

60200-82 - Australia
60287 - Optional - Australia
60291-99 - Tasmania
60400-47 - Papua New Guinea
61400-47 - New Zealand
61457-61 - Cook Islands

61481 - Niue Is.
61500-01 - Western Somoa
62200-99 - British W. Pacific Is.
64100-95 - French Pacific Is.
68500-99 - Other Pacific Is. Nauru, Fiji, Tonga

T.R. 17 - U.S. Atlantic, Gulf, Pacific/Indonesia, Malaysia and Singapore

55700-59 - Malaysia
55900-76 - Singapore
56000-99 - Indonesia
56769-99 - Southern and Southeastern Asia, N.E.S.

T.R. 18 - Atlantic & Gulf - India, Persian Gulf, Red Sea, Pakistan, and Burma

50500-47 - Iraq (P.G.)
50700-51 - Iran (Persia) (P.G.)
50871 - Israel (Red Sea Area)
51105 - Jordan (Aqaba)
51300-25 - Kuwait
51700-27 - Saudi Arabia, R.S. and P.G.
51800-25 - Quatar

52000-05 - United Arab Emirates
52100-25 - Yemen Arab Republic
52200-01 - Yemen
52300-30 - Oman
52501-20 - Bahrein
53300-99 - India
53500-99 - Pakistan (Karachi)
53800-27 - Bangladesh

54200-01 - Ceylon (Colombo & all other Ceylon ports)
54600-01 - Burma (Rangoon & all other Burma ports)

72923-99 - Egypt (R.S.)
73201 - Sudan (P. Sudan) R.S.
77000-01 - Berbera, Somali Republic (Northern Reg.)
77405-09 - Eritrea and Ethiopia (Assab & Massawa)
77701 - French Somaliland (R.S.) (Djibouti)

Appendix B -- cont. (B-3 -- cont.)

T.R. 19 - Gulf - Caribbean (Incl. Cristobal & E.C. Mexico)

Same foreign ports as T.R. 4

T.R. 20 - Gulf - East Coast South America

Same foreign ports as T.R. 1

T.R. 21 - Gulf - U.K. Eire, Continental Europe (Incld. No. Spain, Scandinavia and Baltic Ports)

Same foreign ports as T.R. 5, 6 (excluding Newfoundland), 7, 8, and 9

T.R. 22 - Gulf - Far East

Same foreign ports as T.R. 12

T.R. 23 - Pacific - Caribbean (Incl. Critobal & E.C. Mexico)

Same foreign ports as T.R. 4

T.R. 24 - Pacific - East Coast South America

Same foreign ports as T.R. 1

T.R. 25 - Pacific - W.C. South Amer., Central Amer., Mexico and Balboa

20100-46	- W.C. Mexico
20551-99	- Guatemala (W.C.)
21101-99	- E. Salvador
21551-99	- Honduras (W.C.)
21951-99	- Nicaragua (W.C.)
22363-99	- Coasta Rica (W.C.)
22577-99	- Panama (W.C.)
22701, 10, 99	- Canal Zone (W.C.)
30151-99	- Colombia (W.C.) (excl. 30198)
33100-61	- Ecuador
33300-89	- Peru (excl. 33337)
33700-97	- Chile

T.R. 26 - Pacific/Hawaii/Alaska - United Kingdom, Eire, Continental Europe, incl. No. Spain and Scand. & Baltic Ports

Same foreign ports as T.R. 5, 6 (excl. Newfoundland), 7, 8, and 9

Appendix B -- cont. (B-3 -- cont.)

T.R. 26C (65) - Pacific - Mediterranenan

Same foreign ports as T.R. 10

T.R. 27 - Pacific, Hawaii - Australia, New Zeland, and New Guinea & S. Sea Is.

Same foreign ports as T.R. 16

T.R. 28 - Pacific - Middle East (Burma, Ceylon, India, Pakistan, Persian Gulf, Gulf of Aden), (Red Sea)

Same foreign ports as T.R. 18

T.R. 29 - Pacific, Hawaii, Alaska/Far East

Same foreign ports as T.R. 12

T.R. 31 - Gulf/West Coast South America

Same foreign ports as T.R. 2

T.R. 32 - Great Lakes/Europe

Same foreign ports as T.R. 5, 6, 7, 8 and 9 (excl. Newfoundland T.R. 89)

T.R. 33 - Great Lakes/ Caribbean (Incl. E.C. Mexico & Cristobal)

Same foreign ports as T.R. 4

T.R. 34 - Great Lakes/Mediterranena

Same foreign ports as T.R. 10

T.R. 35 - Atlantic/Great Lakes Canada

01000-09999, (except 01822 Montreal)

T.R. 36 - Gulf/Great Lakes Canada

01000-09999, (except 01822 Montreal)

T.R. 37 - California/Great Lakes Canada

01000-09999, (except 01822 Montreal)

T.R. 38 - Washington, Oregon/Great Lakes Canada

01000-09999, (except 01822 Montreal)

Appendix B -- cont. (B-3 -- cont.)

T.R. 54 - Great Lakes/West Africa

Same foreign ports as 14-1

T.R. 55 - Great Lakes/S. & E. Africa

Same foreing ports as 15A

T.R. 56 - Great Lakes/Red Sea, India, P.G., Indo., Malaya, Singapore

Same foreign ports as 17 and 18

T.R. 57 - Round-the-World

T.R. 58 - Great Lakes/Pacific Canada

12200-12497

T.R. 49 - Great Lakes/Far East

Same foreign ports as T.R. 12

T.R. 60 - Great Lakes/Australia

Same foreign ports as T.R. 16

T.R. 71 - Atlantic/West Coast Central America & Mexico

Same foreign ports as T.R. 25 (except Canal Zone) & WCSA

T.R. 72 - Gulf/West Coast Central America & Mexico

Same foreign ports as T.R. 25 (except Canal Zone) & WCSA

T.R. 77 - Atlantic/Pacific Canal Zone

22701 - Balboa
22710 - Rodman
22799 - Other C.Z. (W.C.)

T.R. 78 - Gulf/Pacific Canal Zone

Same foreign ports as T.R. 77

T.R. 80 - Great Lakes/W.C.S.A., C.A. and Mexico

Same foreign ports as T.R. 25

Appendix B -- cont. (B-3 -- cont.)

T.R. 81 - Atlantic/Atlantic Canada

01822 - Montreal
13400-14499, 15101 - Atlantic Canada
15200-96 - Newfoundland (So. Atl. only)
15298,15299 - Labrador

T.R. 82 - Gulf/Atlantic Canada

Same as T.R. 81 (including Newfoundland)

T.R. 83 - Pacific/Atlantic Canada

Same as T.R. 81 (including Newfoundland)

T.R. 84 - Great Lakes/E.C. South America

Same foreign ports as T.R. 1

T.R. 85 - Atlantic/Pacific Canada

12200-12497

T.R. 86 - Gulf/Pacific Canada

12200-12497

T.R. 87 - Pacific/Pacific Canada

12200-12497

T.R. 89 - Great Lakes/Atlantic Canada

Same as T.R. 81 (except Montreal (01822))

T.R. 91 - Puerto Rico/Foreign, Virgin Islands/Foreign

T.R. 92 - Hawaii/Foreign (except T.R. 26, 27 and 29)

T.R. 93 - Alaska/Foreign (except T.R. 26 and 29)

T.R. 61 - U.S. Great Lakes/Canada Great Lakes (Trans-Lakes)

Source: Division of Trade Studies and Statistics, Office of Subsidy Administration, Maritime Administration.

Appendix B -- cont.

COASTAL DISTRICTS

U.S. Coastal District		Customs District and Port Coverage
Code No.	Description	
1	North Atlantic	Districts 01 through 06 District 10 District 11 District 13 District 14 District 54
2	South Atlantic	Districts 15 through 17 District 18 (following ports only): 1803, 1805, 1809, 1816 District 52 (except 5202)
3	Gulf	District 18 (following ports only):1801, 1807, 1814 Districts 19 through 23 District and port 4115 District 45 District and port 5202 District 53
4	California	District 25 District 27 District 28
5	Pacific Northwest	District 29 District 30
6	Great Lakes	District 07 District 09 District and ports 3423 and 3424
7	Hawaii	District 32
8	Alaska	District 31
9	Puerto Rico	District 49 District 51

Appendix C

TRADE ROUTE DISTANCES
(Round Trip)

Trade Route	Bulk Distance	General Cargo Distance
1	9000	13500
2	6500	9000
4	3500	5000
5-7-8-9-11	7000	8000
10	9000	12000
12	19000	27000
13 Atl.	9000	12000
13 Gulf	11500	15500
41	10000	14000
42	11500	15500
43	16500	22000
51	15000	20000
52	16000	22000
53	21000	28500
16 Atl.	19500	26500
16 Gulf	18500	25500
17 Atl.	20500	28000
17 Gulf	23000	31000
17 Pacific	14000	19000
18 Atl.	23500	29500
18 Gulf	24694	33500
19	3500	4500
20	10500	14500
21	10000	12000
22	21000	26500
23	8000	10500
24	15500	17000
25	9500	13000
26	17500	24000
65	21500	29000
27	14500	19500
28	31000	41500
29	11500	16500
31	5500	10500
71	4500	6000
72	2500	3500
77	3500	4500
78	3000	4000
85	11500	15500
86	11000	15000
87	250	250

Appendix C -- cont.

Trade Route Distances -- cont.

32	7500	10500
33	9000	12000
34	11500	15500
35	8000	11000
36	11000	15000
37	13500	13000
38	15000	20500
54	13500	18500
55	8500	11500
56	26500	
58	15500	21000
59	26000	35000
60	23000	31000
80	10000	13500
81	1500	2000
82	4500	6000
83	11000	15000
84	15500	21000
91	23500	29500
89	3000	4000
92	19000	26000
93	19500	26500
61	300	300

Source: Temple, Barker and Sloan, A Study of the Future Requirements For Ships Engaged in U.S. Waterborne Foreign Trade.

Appendix D

FORECASTING PROCEDURE

Data for U.S. waterborne trade time series files are obtained from Census tapes, SA 305 for imports and SA 705 for exports. The computer files contain 354 time series (175 import and 179 export) from 1967 to 1975 at the 3-digit commodity level, in the Schedule A and B Codes. As the majority of these individual commodity time series represent minor quantities, they have been aggregated into 41 import and 41 export groups with common economic characteristics. The list of these groups and their Schedule A and B Codes are listed in Appendix E.

The 82 aggregated time series were loaded in data banks on the DRI, Data Resources, Inc., system which has a set of computer programs adequate for regression analysis and forecasting, and also provides ready access to a large number of economic time series to which waterborne trade is related. The analysis consisted primarily in the search for and quantification of such relationships. For example, imports of wood, lumber and cork were related to U.S. housing starts; coal exports to industrial production in Japan, and so on. The resulting regression models, one for each import and export group are listed as forecast equations in Appendix F. Also listed in Appendix G are the independent variables used to forecast waterborne trade.

Projections of the independent variables are those contained in the December 1976 Trendlong simulation of the DRI U.S. Macro-economic Model, covering the period 1976 to 1990. The 82 import/export models developed by MarAd were tested with the standard statistical techniques, and the t-ratios of the coefficients and the coefficients of determination are included in Appendix F. In addition forecasts from the 82 models were compared with information from outside sources. Most frequently used references were from:

U.S. Department of Agriculture, Economic Research Service
U.S. Department of Interior, Bureau of Mines
Federal Energy Administration

In order to meet the needs of the Maritime Administration as well as those of the industry, the forecasts have been

Appendix D -- cont.

extended to year 2000. The method of forecasting the decade 1990 to 2000 is substantially different from the one outlined above. Forecasts from 1990 to 2000 are primarily mechanical forecasts without the benefit of independent variables and very little in the way of outside references. In each case, the 1980 to 1990 growth rate was used to forecast the period 1990 to 2000.

In addition to the time extensions of the forecast, an extensive disaggregation system has been developed to produce forecasts at the 3-digit level by regions and trade routes. These disaggregated forecasts appear in volumes II and III of this report.

Appendix E

CROSS REFERENCE BETWEEN SCHEDULE A CODES AND MICRO-MODEL CODES

Imports

Micro-Modes Code	Bureau of Census Schedule A Codes	Description
MT01	01	Meat
MT06	06	Sugar
MT0R	0 except 01 and 06	All Other Foods
MT11	11	Beverages
MT12	12	Tobacco
MT21	21	Hides and Skins
MT22	22	Oilseeds, Oil Nuts and Kernels
MT23	23	Crude Rubber
MT24	24	Wood, Lumber and Cork
MT25	25	Pulpwood and Waste Paper
MT26	26	Textile Fibers
MT273	273	Stone, Sand and Gravel
MT27R	27 except 273	Other Crude Materials
MT28	28	Metallic Ores and Scrap
MT29	29	Animal and Vegetable Materials
MT32	32	Coal
MT33	33	Petroleum
MT34	34	Gas
MT4	4	Animal and Vegetable Oils and Fats
MT5	5	Chemicals
MT61	61	Leather Products
MT62	62	Rubber Products
MT63	63	Wood Products
MT64	64	Paper Products
MT65	65	Textile Products
MT661	661	Lime and Cement
MT662	662	Refractory Building Materials
MT663	663	Mineral Manufactures
MT664	664	Glass Manufactures
MT66R	665, 666, and 667	Glassware, Pottery, & Precious Stones
MT67	67	Iron and Steel
MT68	68	Nonferrous Metals
MT69	69	Nails, Bolts, etc.
MT73	73	Transportation Equipment
MT7R	71 and 72	Machinery
MT81	81	Sanitary, Heating & Plumbing Fixtures
MT82	82	Furniture
MT86	86	Scientific Instruments
MT89	89	Miscellaneous Manufactures
MT8R	83, 84, and 85	Clothing, Shoes & Travel Goods
MT9	9	Miscellaneous Transactions

Appendix E -- cont.

CROSS REFERENCE BETWEEN SCHEDULE B CODES AND MICRO-MODEL CODES

Exports

Micro-Model Code	Bureau of Census Schedule B Codes	Description
XT04	04	Grains
XT08	08	Animal Feeds
XT0R	0 except 04 and 08	All Other Foods
XT11	11	Beverages
XT12	12	Tobacco
XT22	22	Oilseeds, Oil Nuts and Kernels
XT24	24	Wood, Lumber and Cork
XT25	25	Pulpwood and Waste Paper
XT266	266	Manmade Fibers
XT26R	26 except 266	Natural Fibers
XT27	27	Crude Fertilizers and Minerals
XT28	28	Metallic Ores and Scrap
XT2R	21, 23 and 29	Other Crude Materials
XT32	32	Coal
XT33	33	Petroleum
XT34	34	Gas
XT4	4	Animal and Vegetable Oils & Fats
XT5	5	Chemicals
XT61	61	Leather Products
XT62	62	Rubber Products
XT63	63	Wood Products
XT64	64	Paper Products
XT65	65	Textile Products
XT664	664	Glass
XT66A	661, 662, and 663	Building Materials
XT66R	665, 666, and 667	Glassware, Pottery & Precious Stones
XT67	67	Iron and Steel
XT68	68	Nonferrous Metals
XT69A	696 and 697	Utensils
XT69R	69 except 696 and 697	Metal Manufactures
XT71	71	Nonelectrical Machinery
XT72	72	Electrical Machinery
XT73	73	Transportation Equipment
XT81	81	Sanitary, Heating & Plumbing Equipment
XT82	82	Furniture
XT83	83	Travel Goods
XT84	84	Clothing
XT85	85	Footwear
XT86	86	Scientific Instruments
XT89	89	Miscellaneous Manufactures
XT9	9	Miscellaneous Transactions

Appendix F

FORECASTING EQUATIONS
IMPORTS

$$\text{MTOR} = 6685.44+\underset{(2.74)}{591.17}(\text{MENDO67})-\underset{(-1.34)}{48.35}(\text{TIME})-\underset{(-1.88)}{372.07}(\text{Dumy 1969,1971});\ R^2 = .70$$

$$\text{MT01} = -1564.84+\underset{(5.67)}{22.37}(\text{CNFOOD 72})-\underset{(-2.04)}{13.44}(\text{TIME})-\underset{(-2.38)}{68.37}(\text{Dumy, 1971});\ R^2 = .93$$

$$\text{MT06}=948.55+\underset{(1.10)}{64.45}(\text{CNFOOD72-1})-\underset{(-0.33)}{52.19}(\text{TIME})-\underset{(-2.13)}{392.92}(\text{Dumy,1969})+\underset{(1.13)}{301.23}(\text{Dumy,1974})-\underset{(-2.61)}{1529.47}(\text{Dumy,1975});R^2=.98$$

$$\text{MT11}=-3417.31+\underset{(3.20)}{16.05}(\text{CNFOOD72-1})+\underset{(2.54)}{27,06}(\text{TIME})-\underset{(-2.14)}{63.36}(\text{Dumy,1969,1971});R^2 = .98$$

$$\text{Log}_{10}\text{MT12}=2.08+\underset{(4.49)}{3.60}\text{Log}_{10}(\text{JFRB21})-\underset{(-1.78)}{.089}(\text{Dumy,1971});R^2\ .86$$

$$\text{MT21}=54.85+\underset{(9.42)}{103.66}(\text{JFRB31})-\underset{(-1.38)}{4.66}(\text{Dumy,1969})\ R^2 = .94$$

$$\text{Log}_{10}\text{MT22}=4.93-\underset{(-1.53)}{.04}(\text{TIME})-\underset{(-5.22)}{.77}(\text{Dumy,1974-1990});\ R^2 = .93$$

$$\text{MT23} = -1432.84+\underset{(2.58)}{461.94}(\text{JFRB})+\underset{(4.14)}{22.53}(\text{TIME});\ R^2 = .94$$

$$\text{MT24}=9311.07+\underset{(5.37)}{1274.04}(\text{HUSTS})-\underset{(-3.45)}{114.79}(\text{TIME})-\underset{(-0.60)}{175.44}(\text{Dumy,1971})\ R^2 = .89$$

$$\text{Log}_{10}\text{MT25}=19.99+\underset{(2.32)}{1.32}\text{Log}_{10}(\text{JFRB26})-\underset{(-6.22)}{9.40}\text{Log}_{10}(\text{TIME})-\underset{(1.51)}{.05}(\text{Dumy, 1969,1971})\ R^2= .92$$

$$\text{Log}_{10}\text{MT26}=2.80-\underset{(-4.04)}{7.59}\text{Log}_{10}(\text{JFRB22})+\underset{(3.33)}{8.74}\text{Log}_{10}(\text{JFRB23});\ R^2 = .73$$

Appendix F -- cont.

$$\text{Log}_{10}\text{MT27R}=1.01+\underset{(1.77)}{.72}\text{Log}_{10}(\text{JFRB})+\underset{(1.94)}{1.47}\text{Log}_{10}(\text{TIME})\underset{(.57)}{-.01}(\text{Dumy},1971);\ R^2=.88$$

$$\text{MT273}=-426.22+\underset{(6.33)}{4440.51}(\text{EC})\underset{(-1.35)}{-96.01}(\text{TIME})\underset{(-1.46)}{-616.85}(\text{Dumy},1971);\ R^2=.92$$

$$\text{MT28}=84334.85+\underset{(8.11)}{47751.67}(\text{JFRB33-1})\underset{(-5.56)}{-1105.81}(\text{TIME});R^2=.92$$

$$\text{MT29}=267.18$$

$$\text{MT32*}=-8458.80+\underset{(4.58)}{8476.52}(\text{JFRB-1})\underset{(-1.02)}{-702.87}(\text{Dumy},1969)\underset{(5.47)}{+2924.75}(\text{Dumy},1974);R^2=.96$$

$$\text{MT33*}=10.84+\underset{(7.62)}{408.94}(\text{MEND1067});\ R^2=.99$$

$$\text{MT34}=-12982.58+\underset{(2.15)}{4347.92}(\text{JFRB})+\underset{(1.99)}{123.81}(\text{TIME});\ R^2=.87$$

$$\text{MT4}=-65.96+\underset{(2.93)}{2037.53}(\text{JFRB284})\underset{(0.82)}{-23.77}(\text{TIME})\underset{(-1.11)}{-96.27}(\text{Dumy},1969);R^2=.90$$

$$\text{MT5}=-5408.30+\underset{(12.21)}{8907.00}(\text{JFRB28})\underset{(-2.07)}{-845.57}(\text{Dumy},1969);R^2=.97$$

$$\text{MT61}=-84.62+\underset{(0.69)}{26.12}(\text{E23})+\underset{(2.24)}{1.02}(\text{TIME})\underset{(-2.00)}{-11.57}(\text{Dumy},1975);R^2=.81$$

$$\text{MT62}=-1387.31+\underset{(1.68)}{3.56}(\text{CDMV\&P72})+\underset{(4.01)}{19.57}(\text{TIME})\underset{(-1.01)}{-22.71}(\text{Dumy }1969,1971);\ R^2=.92$$

$$\text{MT63}=539.30+\underset{(6.93)}{947.70}(\text{HUSTS})\underset{(-0.42)}{-71.92}(\text{Dumy},1969);\ R^2=.89$$

$$\text{Log}_{10}\text{MT64}=11.52+\underset{(3.00)}{.30}\text{Log}_{10}(\text{HUSTS})+\underset{(1.74)}{1.53}\text{Log}_{10}(\text{JFRB27})\underset{(-3.71)}{-4.47}\text{Log}_{10}(\text{TIME})\underset{(.80)}{-.04}(\text{Dumy},1975);\ R^2=.96$$

$$\text{MT65}=1733.38+\underset{(4.13)}{222.23}(\text{HUSTS})\underset{(-2.20)}{-17.85}(\text{TIME});\ R^2=.77$$

Appendix F -- cont.

$$\text{MT661}=-25852.9+\underset{(2.44)}{1570(\text{HUSTS-1})}+\underset{(4.07)}{367.97(\text{TIME})}-\underset{(-1.48)}{1176.96(\text{Dumy,1971})};\ R^2=.84$$

$$\text{Log}_{10}\text{MT662}=-2.46+\underset{(2.06)}{.56\text{Log}_{10}(\text{IP\&E72\$331})}+\underset{(3.89)}{2.33\text{Log}_{10}(\text{IC72})}-\underset{(-1.53)}{.07(\text{Dumy,1971})};\ R^2=.83$$

$$\text{MT663}=-52.13+\underset{(6.27)}{2.80(\text{IP\&E72\$M})}-\underset{(-8.35)}{29.72(\text{Dumy,1967})};\ R^2=.94$$

$$\text{Log}_{10}\text{MT664}=15.22+\underset{(7.58)}{1.00(\text{HUSTS})}-\underset{(-9.07)}{6.97(\text{TIME})}-\underset{(-3.19)}{.13(\text{Dumy,1971})};\ R^2=.96$$

$$\text{MT66R}=132.63+\underset{(4.95)}{12.68(\text{MEND467})}-\underset{(-2.44)}{29.94(\text{Dumy,1971})};\ R^2=.83$$

$$\text{MT67}=-40133.30+\underset{(1.02)}{3281.09(\text{EC})}+\underset{(1.01)}{690.89(\text{TIME})}-\underset{(-1.32)}{7037.02(\text{WPIW})}+\underset{(2.67)}{4576.49(\text{Dumy,1968})};\ R^2=.74$$

$$\text{MT68}=4872.09+\underset{(1.04)}{688.61(\text{JFRB})}-\underset{(-3.26)}{65.31(\text{TIME})}-\underset{(-3.66)}{262.73(\text{Dumy,1969 through 1971})};\ R^2=.83$$

$$\text{MT69}=2846.3+\underset{(6.06)}{635.00(\text{EC})}+\underset{(2.27)}{24.08(\text{TIME})}-\underset{(-1.03)}{64.45(\text{Dumy,1971})};\ R^2=.96$$

$$\text{MT7R}=-3334.04+\underset{(.44)}{91.75(\text{MEND267})}+\underset{(.86)}{61.89(\text{TIME})};\ R^2=.76$$

$$\text{MT73}=4017.91+\underset{(6.41)}{344.35(\text{MEND367})}+\underset{(2.14)}{57.78(\text{TIME})}-\underset{(-2.08)}{286.35(\text{Dumy,1969})};\ R^2=.98$$

$$\text{MT812}=35.97+\underset{(4.94)}{16.16(\text{HUSTS})}-\underset{(-0.83)}{.38(\text{TIME})}-\underset{(-2.25)}{9.07(\text{Dumy,1971})};\ R^2=.83$$

$$\text{MT82}=-297.60+\underset{(5.56)}{63.83(\text{HUSTS-1})}+\underset{(2.62)}{4.52(\text{TIME})};\ R^2=.93$$

$$\text{MT8R}=-499.58+\underset{(5.12)}{7.72(\text{CNCS72+CNOO72})};\ R^2=.79$$

Appendix F -- cont.

$$\mathrm{MT86}=-159.07+\underset{(2.98)}{88.59}(\mathrm{JFRB})+\underset{(1.62)}{1.56}(\mathrm{TIME})\underset{(-1.28)}{-6.24}(\mathrm{Dumy},1969)\,;R^2=.92$$

$$\mathrm{MT89}=-219.65+\underset{(4.49)}{8.08}(\mathrm{CD72})\,;\ R^2=.78$$

$\mathrm{MT9}=170.9$

Appendix F -- cont.

FORECASTING EQUATIONS
EXPORTS

$$\mathrm{XT04} = 60726.3 + \underset{(1.18)}{33982.5}(\mathrm{JQINDW}) - \underset{(-88)}{101.19}\ (\mathrm{RWGRAIN} - 1)$$
$$+\ \underset{(3.34)}{29517.8}\ (\text{Dumy, 1973 through 1990});\ R^2 = .88$$

$$\mathrm{XT081} = -2858.6 + \underset{(6.59)}{5909.5}\ (\mathrm{JQINDW})\ \underset{(-1.67)}{-6.42}\ (\mathrm{RWGRAIN} - 1)$$
$$+\ \underset{(.59)}{60.2}\ (\mathrm{TIME})\ \underset{(-2.6)}{-60.57}\ (\text{Dumy, 73, 74});\ R^2 = .97$$

$$\mathrm{XTOR} = 1319.5 + \underset{(3.35)}{629.15}\ (\mathrm{WPIW})\ \underset{(-.04)}{-.065}(\ \mathrm{RWGRAIN});\ R^2 = .69$$

$$\mathrm{XT11} = -71.67 + \underset{(14.19)}{66.71}(\mathrm{WPIW}) + \underset{(5.83)}{34.03}(\mathrm{JQINDW}) + \underset{(6.62)}{19.23}(\text{Dumy,74});R^2 = 99$$

$$\mathrm{XT12} = 111.37 + \underset{(.49)}{72.5}(\mathrm{JQINDW}) + \underset{(.18)}{2.08}\ (\mathrm{TIME});\ R^2 = .36$$

$$\mathrm{XT2R} = -188.79 - \underset{(-.06)}{15.98}(\mathrm{JQINDW}) + \underset{(.04)}{.88}\ (\mathrm{EXEND167}) + \underset{(.82)}{12.66}(\mathrm{TIME});R^2 = .49$$

$$\mathrm{XT221} = 5762.86 + \underset{(3.41)}{4662.71}(\mathrm{JQINDW} - 1)\ \underset{(-3.05)}{-2359.67}(\text{Dumy,67,68,69});R^2 = .95$$

$$\mathrm{XT24} = 1547.6 - \underset{(-.11)}{69.18}(\mathrm{TIME}) + \underset{(.38)}{5087.22}(\mathrm{JFRB24}) + \underset{(.53)}{6303.76}(\mathrm{JQINDW}):R^2 = .72$$

$$\mathrm{XT251} = 5361.47 + \underset{(3.56)}{2090.20}(\mathrm{JQINDW}) - \underset{(-4.24)}{80.02}(\mathrm{TIME}) - \underset{(-.41)}{368.78}(\mathrm{JFRB}\quad) + \underset{(10.74)}{794.87}$$
$$(\text{Dumy, 1970, 1974-90});\ R^2 = .99$$

$$\mathrm{XT266} = 340.27 + \underset{(.85)}{121.99}(\mathrm{JQINDW}) - \underset{(-1.54)}{7.85}(\mathrm{TIME}) + \underset{(1.51)}{97.06}(\mathrm{JFRB282});R^2 = 9$$

$$\mathrm{Log\ XT26R} = \mathrm{Log}(1461.4) + \mathrm{Log}(1.005)\ (\mathrm{TIME} - 75)$$

$$\mathrm{XT27} = 815.59 + \underset{(1.89)}{8633.45}(\mathrm{JQINDW}) + \underset{(.22)}{98.29}(\mathrm{TIME}) - \underset{-(.22)}{2566.56}(\mathrm{JFRB287});$$
$$R^2 = .81$$

$$\mathrm{XT28} = 37329.9 - \underset{(-.86)}{8673.38}(\mathrm{JFRB33}) + \underset{(1.68)}{40916.1}(\mathrm{JFRBMI}) + \underset{(.38)}{6047.06}(\mathrm{JQINDW})$$
$$\underset{(-1.06)}{-959.38}(\mathrm{TIME})\underset{(-4.04)}{-4400.56}(\text{Dumy,71,72});\ R^2 = .91$$

Appendix F -- cont.

$$\text{XT321}=37652.7+\underset{(1.88)}{8530.74}(\text{IPIJP})+\underset{(3.34)}{14642.4}(\text{Dumy},70);\ R^2=.71$$

$$\text{XT33}=17330.3-\underset{(-.92)}{96.48}(\text{TIME});\ R^2=.12$$

$$\text{XT341}=1227.54-\underset{(-.25)}{3.82}(\text{TIME});\ R^2=.23$$

$$\text{XT4}=2149.23+\underset{(.54)}{812.57}(\text{JQINDW})-\underset{(-.2)}{20.53}(\text{TIME})+\underset{(1.2)}{306.17}(\text{Dumy},71,72,73)\ R^2=.58$$

$$\text{XT5}=3988.29-\underset{(-.17)}{1547}(\text{JQINDW})+\underset{(.98)}{10764.7}(\text{JFRB28})-\underset{(-.08)}{26.24}(\text{TIME});\ R^2=.84$$

$$\text{XT61}=-36.39+\underset{(.85)}{10.2}(\text{JQINDW})+\underset{(.6)}{.52}(\text{TIME})-\underset{(-.3)}{1.03}(\text{Dumy},70);\ R^2=.79$$

$$\text{XT62}=19.19+\underset{(.81)}{35.37}(\text{JQINDW})+\underset{(.11)}{4.52}(\text{JFRB30})+\underset{(6.9)}{45.54}(\text{Dumy},74,75);\ R^2=.95$$

$$\text{XT63}=-9556.47+\underset{(1.28)}{4786.08}(\text{JFRB25})+\underset{(3.4)}{6349.68}(\text{JQINDW});\ R^2=.88$$

$$\text{XT64}=4298.34-\underset{(-.48)}{67.31}(\text{TIME})+\underset{(.45)}{1459}(\text{JQINDW})+\underset{(.19)}{604.7}(\text{JFRB26});R^2=.58$$

$$\text{XT65}=2464.93+\underset{(5.18)}{503.49}(\text{JQINDW})+\underset{(1.2)}{112.91}(\text{JFRB22})-\underset{(-6.3)}{50.6}(\text{TIME})$$
$$+\underset{(13.86)}{510}(\text{WPIW});\ R^2=.99$$

$$\text{XT66A}=31.14+\underset{(8.50)}{314.01}(\text{WPIW});\ R^2=.91$$

$$\text{XT664}=983.46-\underset{(-5.47)}{17.86}(\text{TIME})+\underset{(5.5)}{153.82}(\text{JQINDW})+\underset{(7)}{122.33}(\text{WPIW}):R^2=.92$$

$$\text{XT66R}=454.27-\underset{(-2.92)}{7.39}(\text{TIME})+\underset{(6.04)}{87.23}(\text{WPIW})+\underset{(1.02)}{21.57}(\text{JQINDW})$$
$$+\underset{(10.15)}{47.78}(\text{Dumy},74,75);\ R^2=.99$$

$$\text{XT67}=-3844.4+\underset{(.46)}{1682}(\text{JQINDW})+\underset{(1.56)}{7951}(\text{JFRB331VR})$$
$$-\underset{(-.36)}{1233.41}(\text{EC})+\underset{(4.28)}{3742.83}(\text{Dumy},\ 70);\ R^2=.85$$

$$\text{XT68}=6297.38-\underset{(-.74)}{107}(\text{TIME})+\underset{(.37)}{744.7}(\text{JQINDW})+\underset{(.06)}{71.89}(\text{JFRB333VR})$$
$$+\underset{(1.5)}{621.05}(\text{WPIW})+\underset{(1.8)}{247.03}(\text{Dumy},\ 70);\ R^2=.72$$

Appendix F -- cont.

$$\text{XT69A}=126.35\underset{(-1.73)}{-2.25(\text{TIME})}\underset{(.63)}{+9.98(\text{JQINDW})}\underset{(.43)}{+5.84(\text{JFRB34})}$$

$$\underset{(3.5)}{+21.06(\text{WPIW})};\ R^2=.94$$

$$\text{XT69R}=2301.95\underset{(-3.29)}{-4304(\text{TIME})}\underset{(2.62)}{+293.34(\text{JQINDW})}\underset{(8.37)}{+585.33(\text{WPIW})};\ R^2=.99$$

$$\text{XT71}=287.47\underset{(-.99)}{-431.89(\text{JFRB35})}\underset{(3.5)}{+1435.2(\text{WPIW})}\underset{(1.24)}{+259.52(\text{Dumy},74\text{-}90)};R^2=.98$$

$$\text{XT72}=-51.63\underset{(11.35)}{+385.64(\text{WPIW})}\underset{(2.95)}{+62.63(\text{JQINDW})}\underset{(-5.86)}{-150.19(\text{JFRB36})}$$

$$\underset{(.14)}{+2.35(\text{Dumy},74\text{-}90)};R^2=.99$$

$$\text{XT73}=222.74\underset{(2.75)}{+109.27(\text{EXEND367})}\underset{(2.90)}{+370.72(\text{Dumy},\ 1975\text{-}90)};\ R^2=.87$$

$$\text{XT812}=139.19\underset{(2.7)}{+14.97(\text{WPIW})}\underset{(-2.11)}{-2.19(\text{TIME})}\underset{(1.82)}{+16.13(\text{JQINDW})};R^2=.67$$

$$\text{XT821}=213.96\underset{(1.21)}{+3.36(\text{JFRB35})}\underset{(21.45)}{+35.48(\text{WPIW})}\underset{(6.17)}{+21.46(\text{JQINDW})}$$

$$\underset{(-11.55)}{-3.79(\text{TIME})};\ R^2=.99$$

$$\text{XT831}=10.24\underset{(-3.39)}{-.22(\text{TIME})}\underset{(10.77)}{+3.98(\text{WPIW})}\underset{(3.56)}{+1.93(\text{JQINDW})}\underset{(10.42)}{+1.26(\text{Dumy},74)};R^2=.99$$

$$\text{XT84}=66.66\underset{(.09)}{+.92(\text{WPIW})}\underset{(-.09)}{-2.31(\text{JQINDW})}\underset{(-.06)}{-1.32(\text{JFRB23})}\underset{(-.25)}{-.57(\text{TIME})}$$

$$\underset{(1.39)}{+4.52(\text{Dumy},\ 74)};\ R^2=.76$$

$$\text{XT851}=-5.36\underset{(-.001)}{-.01(\text{JFRB23})}\underset{(1.75)}{+.09(\text{TIME})}\underset{(.55)}{+.24(\text{Dumy},74)};\ R^2=.50$$

$$\text{XT86}=366.29\underset{(1.42)}{+74.29(\text{JQINDW})}\underset{(3.22)}{+98.26(\text{WPIW})}\underset{(-.28)}{-13.33(\text{JFRB38})}\underset{(-1.56)}{-6.94(\text{TIME})};R^2=.95$$

$$\text{XT89}=15.1\underset{(-.11)}{-1.07(\text{TIME})}\underset{(1.12)}{+96.45(\text{JQINDW})}\underset{(1.52)}{+82.23(\text{WPIW})};\ R^2=.91$$

$$\text{XT9}=43.19\underset{(3.1)}{+14.68(\text{WPIW})}\underset{(-1.4)}{-.67(\text{TIME})}\underset{(6.87)}{+11.85(\text{Dumy},72)};\ R^2=.94$$

Appendix G

G-1

INDEPENDENT VARIABLES

CD72............U.S. CONSUMPTION EXPENDITURES ON DURABLE GOODS IN CONSTANT 1972 DOLLARS
CDMV&P72........U.S. CONSUMPTION EXPENDITURES ON AUTOMOBILES AND PARTS IN CONSTANT 1972 DOLLARS
CNCS72..........U.S. CONSUMPTION EXPENDITURES ON CLOTHING AND SHOES IN CONSTANT 1972 DOLLARS
CNFOOD72........U.S. FOOD CONSUMPTION EXPENDITURES IN CONSTANT 1972 DOLLARS
CNO072..........U.S. CONSUMPTION EXPENDITURES ON NON-DURABLE GOODS IN CONSTANT 1972 DOLLARS
EC..............U.S. EMPLOYMENT IN CONTRACT CONSTRUCTION
E23.............U.S. EMPLOYMENT IN APPAREL PRODUCTION
EXEND167........U.S. EXPORTS OF INDUSTRIAL SUPPLIES AND MATERIALS IN CONSTANT 1972 DOLLARS
HUSTS...........U.S. HOUSING STARTS
IC72............INVESTMENT IN STRUCTURES IN CONSTANT 1972 DOLLARS
IP&E72$M........INVESTMENT IN PLANT AND EQUIPMENT----MANUFACTURING, IN CONSTANT 1972 DOLLARS
IP&E72$331......INVESTMENT IN PLANT AND EQUIPMENT----BLAST FURNACES, IN CONSTANT 1972 DOLLARS
IPIJP...........INDUSTRIAL PRODUCTION OF JAPAN
JFRB............U.S. INDUSTRIAL PRODUCTION----TOTAL
JFRB21..........U.S. INDUSTRIAL PRODUCTION----TOBACCO
JFRB22..........U.S. INDUSTRIAL PRODUCTION----TEXTILES
JFRB23..........U.S. INDUSTRIAL PRODUCTION----APPAREL
JFRB24..........U.S. INDUSTRIAL PRODUCTION----LUMBER AND PRODUCTS
JFRB25..........U.S. INDUSTRIAL PRODUCTION----FURNITURE AND FIXTURES
JFRB26..........U.S. INDUSTRIAL PRODUCTION----PAPER AND PRODUCTS
JFRB27..........U.S. INDUSTRIAL PRODUCTION----PRINTING AND PUBLISHING
JFRB28..........U.S. INDUSTRIAL PRODUCTION----CHEMICALS AND PRODUCTS
JFRB282.........U.S. INDUSTRIAL PRODUCTION----SYNTHETIC MATERIALS
JRFB284.........U.S. INDUSTRIAL PRODUCTION----SOAPS AND TOILETRIES
JFRB287.........U.S. INDUSTRIAL PRODUCTION----AGRICULTURAL CHEMICALS
JFRB30..........U.S. INDUSTRIAL PRODUCTION----RUBBER AND PLASTICS
JFRB31..........U.S. INDUSTRIAL PRODUCTION----LEATHER AND PRODUCTS
JFRB33..........U.S. INDUSTRIAL PRODUCTION----PRIMARY METALS
JFRB331vr.......U.S. INDUSTRIAL PRODUCTION----BASIC STEEL AND MILL PRODUCTS
JFRB333vr.......U.S. INDUSTRIAL PRODUCTION----NONFERROUS METALS
JFRB34..........U.S. INDUSTRIAL PRODUCTION----FABRICATED METALS
JFRB35..........U.S. INDUSTRIAL PRODUCTION----NONELECTRICAL MACHINERY
JFRB36..........U.S. INDUSTRIAL PRODUCTION----ELECTRICAL MACHINERY
JFRB38..........U.S. INDUSTRIAL PRODUCTION----INSTRUMENTS
MEND067.........U.S. IMPORTS OF FOODS, FEEDS AND BEVERAGES IN CONSTANT 1967 DOLLARS
MEND267.........U.S. IMPORTS OF CAPITAL GOODS EXCEPT AUTOMOTIVE IN CONSTANT 1967 DOLLARS

MEND1067	U.S. IMPORTS OF FUELS AND LUBRICANTS IN CONSTANT 1967 DOLLARS
MEND367	U.S. IMPORTS OF AUTOMOBILES AND PARTS IN CONSTANT 1967 DOLLARS
MEND467	U.S. IMPORTS OF CONSUMERS GOODS EXCEPT AUTOMOTIVE IN CONSTANT 1967 DOLLARS
RWGRAIN	REST OF WORLD PRODUCTION OF GRAIN
WPIW	COMPOSITE WHOLESALE PRICE INDEX OF THE MAJOR U.S. TRADING PARTNERS
JQINDW	TRADE WEIGHTED INDUSTRIAL PRODUCTION INDEX FOR CANADA, JAPAN AND OECD EUROPE
EXEND367	U.S. EXPORTS OF AUTOMOBILES AND PARTS IN CONSTANT 1967 DOLLARS

G-2

INDEPENDENT VARIABLES

VARIABLE	UNITS	HISTORY - 1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	- FORECAST - 1980	1985	1990
CD72	$BIL.	79.68	88.25	91.88	88.90	98.13	111.25	121.80	112.27	111.88	125.68	162.62	207.60	265.11
CDMV&P72	$BIL.	34.85	40.20	41.35	37.15	44.03	50.55	54.60	44.40	44.68	54.90	71.56	83.67	101.33
CNCS72	$BIL.	46.95	48.60	49.55	49.18	51.63	55.15	59.15	58.93	61.28	63.64	76.03	89.76	103.30
CNFOOD72	$BIL.	136.70	142.00	144.02	147.30	147.52	150.42	150.63	147.52	150.50	157.95	179.54	198.18	217.53
CNOO72	$BIL.	57.43	59.97	61.85	63.75	64.68	68.93	74.05	72.38	69.52	71.64	82.18	92.97	105.19
EC	MIL.	3.21	3.30	3.52	3.54	3.63	3.83	4.01	3.95	3.46	3.38	4.20	5.00	4.59
E23	MIL.	1.40	1.41	1.41	1.36	1.35	1.37	1.41	1.35	1.24	1.30	1.45	1.61	1.70
EXEND167	$BIL.	10.00	11.24	11.86	13.25	11.98	12.85	15.73	16.40	14.52	15.42	18.79	21.34	24.21
EXEND367	$BIL.	2.80	3.43	3.68	3.41	3.84	4.29	4.95	5.60	5.93	6.28	8.71	11.40	14.40
HUSTS	MIL.	1.28	1.50	1.49	1.43	2.04	2.36	2.04	1.33	1.16	1.54	2.06	2.35	2.15
IC72	$BIL.	77.48	83.88	85.32	82.27	92.90	103.45	103.95	85.80	73.98	84.00	108.28	125.25	127.82
IP&E72SM	$BIL.	36.48	34.65	36.78	35.21	31.24	31.27	36.42	39.19	35.97	37.61	49.19	60.50	71.31
IP&E72$331	$BIL.	2.49	2.48	2.18	1.86	1.45	1.25	1.32	1.75	2.20	2.09	3.15	4.44	5.00
JFRB	INDEX*	1.00	1.06	1.11	1.07	1.07	1.15	1.25	1.24	1.13	1.23	1.52	1.87	2.25
JFRBMI	INDEX*	1.00	1.04	1.07	1.10	1.07	1.09	1.10	1.09	1.07	1.09	1.22	1.35	1.44
JFRB21	INDEX*	1.00	1.00	0.97	1.00	0.98	1.04	1.11	1.06	1.08	1.11	1.11	1.20	1.30
JFRB22	INDEX*	1.00	1.09	1.13	1.06	1.08	1.17	1.28	1.22	1.10	1.25	1.47	1.77	2.21
JFRB23	INDEX*	1.00	1.02	1.03	0.98	0.98	1.06	1.13	1.05	0.94	1.04	1.27	1.46	1.65
JFRB24	INDEX*	1.00	1.05	1.09	1.06	1.14	1.22	1.29	1.19	1.09	1.24	1.59	1.85	2.01
JFRB25	INDEX*	1.00	1.05	1.07	0.99	1.02	1.14	1.26	1.27	1.10	1.16	1.49	1.84	2.05
JFRB26	INDEX*	1.00	1.06	1.14	1.13	1.16	1.28	1.35	1.33	1.15	1.37	1.66	1.99	2.31
JFRB27	INDEX*	1.00	1.03	1.06	1.04	1.02	1.08	1.13	1.12	1.05	1.10	1.36	1.60	1.85
JFRB28	INDEX*	1.00	1.10	1.20	1.20	1.26	1.40	1.50	1.54	1.43	1.60	2.10	2.85	3.75
JFRB282	INDEX*	1.00	1.22	1.36	1.38	1.57	1.89	2.15	2.15	1.84	2.25	2.94	4.42	6.73
JFRB284	INDEX*	1.00	1.05	1.13	1.15	1.10	1.20	1.19	1.24	1.37	1.48	1.71	1.90	2.20
JFRB287	INDEX*	1.00	0.99	1.01	1.00	0.96	1.04	1.07	1.10	1.12	1.25	1.44	1.83	2.23
JFRB30	INDEX*	1.00	1.13	1.20	1.16	1.26	1.46	1.64	1.63	1.41	1.66	2.18	2.93	3.70
JFRB31	INDEX*	1.00	1.06	0.96	0.91	0.87	0.89	0.84	0.77	0.73	0.80	0.83	0.89	0.80
JFRB33	INDEX*	1.00	1.03	1.14	1.07	1.01	1.13	1.26	1.23	0.97	1.10	1.45	1.70	1.86
JFRB331VR	INDEX*	1.00	1.03	1.13	1.05	0.96	1.07	1.21	1.19	0.96	1.08	1.37	1.56	1.68
JFRB333VR	INDEX*	1.00	1.03	1.16	1.10	1.09	1.24	1.37	1.31	1.00	1.19	1.60	1.97	2.21
JFRB34	INDEX*	1.00	1.06	1.14	1.09	1.08	1.15	1.31	1.30	1.14	1.23	1.52	1.78	2.00
JFRB35	INDEX*	1.00	1.01	1.06	1.01	0.94	1.06	1.25	1.33	1.18	1.23	1.58	2.03	2.47
JFRB36	INDEX*	1.00	1.03	1.08	1.00	0.98	1.09	1.27	1.25	1.06	1.15	1.49	1.91	2.30
JFRB38	INDEX*	1.00	1.07	1.16	1.11	1.08	1.20	1.39	1.44	1.34	1.45	1.87	2.36	2.89
JQINC158	INDEX*	1.00	1.15	1.33	1.52	1.56	1.67	1.97	1.89	1.68	1.90	2.48	3.45	4.58
JOINDW	INDEX*	1.00	1.09	1.20	1.29	1.34	1.43	1.60	1.59	1.47	1.59	2.00	2.62	3.32
MEND067	$BIL.	4.60	5.18	4.93	5.28	5.45	5.82	5.95	5.51	4.86	5.54	5.50	5.57	6.32
MEND267	$BIL.	2.39	2.76	3.08	3.14	3.13	4.05	4.56	4.97	4.64	5.12	7.84	13.85	20.80
MEND367	$BIL.	2.65	4.12	4.91	4.69	6.07	6.49	6.55	6.60	5.26	6.97	8.15	8.99	10.55
MEND467	$BIL.	4.23	5.25	6.38	6.87	7.23	8.85	9.04	8.14	6.35	8.44	11.50	13.33	25.73
MEND1067	$BIL.	2.24	2.53	2.83	2.95	3.44	4.24	5.80	5.35	5.37	6.70	7.25	7.72	8.06
RWGRAIN	MIL.+	582.20	625.20	625.60	641.60	678.50	664.80	738.40	710.70	690.00	727.49	765.43	849.25	942.24
WPIW	INDEX#	0.92	0.93	0.97	1.00	1.02	1.07	1.24	1.55	1.66	1.78	2.34	2.95	3.52

SOURCE: DATA RESOURCES INC., QUARTERLY MODEL OF THE U.S.ECONOMY. TRENDLONG SOLUTION. 12/76.

* 1967 = 1.00.

+ METRIC TONS.

# 1970 = 1.00.

Appexdix H

REGIONAL AND TRADE ROUTE DISAGGREGATION METHODOLOGY

A. 82 Micro-Model National Forecasts into 3-digit Schedule A B Disaggregated National Forecast

Step 1. Project historical time trend of raw or unadjusted 3-digit Schedule A and B nine-year (1967-75) history.

(a) $LGT_t = a + bT_t$

If b coefficient is found to be negative,

(b) $LGT_t = e^a + bT_t$

Where, LGT = Foreign trade (exports or imports) in long tons
T = Time
t = 1967 to 1975 for regression, and 1976 to 2000 for forecast

Step 2. Converge growth rates of raw 3-digit forecast to growth rates of micro-model forecast.

(a) $GR_t' = MMGR_t + R^*Z_t^*(GR_t - MMGR_t)$

Where, GR = Raw 3-dight forecast growth factor
GR' = Adjusted growth factor
MMGR = Micro-model forecast growth factor. 1980-90 compound growth rate used for 1990-2000.
R = Correlation Coefficient of time trend regression of raw 3-digit Schedule A and B commodities.
Z_t = .95, .90, .85, .80, .75, .65, .55, .45, .35, .30, .25, .20, .15, .10, .05 for t = 1976 to 1990 respectively.
Z_t = 0 for t = 1991 to 2000.

(b) $CLGT_t = LGT_t^* \ GR_t$ (for t = 1976 to 2000)

Appendix H -- cont.

Step 3. Force micro-model reaggregation of converged 3-digit projections to be consistent with original micro-model forecast.

(a) $LGT_t = CLGT_t * (MMLGT_t / MMSUMLGT_t)$

Where, LGT = Consistent 3-digit forecast
CLGT = Converged 3-dight forecast
MMLGT = Original micro-model forecast
MMSUMLGT = Micro-model reaggregation of converged 3-digit projections.

B. 3-digit National Forecasts into 3-digit Regional Forecasts.

Step 1. Estimate and forecast historical relationship between regional and national commodity flows.

(a) $RLGT_t = a + b*NLGT_t$ (t = 1967 to 1975 for regression and 1976 to 2000 for forecast)

(b) If last three years are zero, override forecast with zeros.

Where, RLGT = Regional foreign trade in long tons at 3-digit level
NLGT = National foreign trade in long tons at 3-digit level

Step 2. Force national reaggregation of regional projections to be consistent with 3-digit national forecast.

(a) $CRLGT_t = RLGT_t * (NLGT_t / RSUMLGT_t)$

Where, CRLGT = Forced or converged RLGT.
RSUMLGT = National reaggregation of raw 3-digit projections of RLGT.

C. Disaggregation of Regional Forecast to Trade Route/Coastal District Forecast.

Step 1. Multiply regional forecast by average ratio of each occurrence of a trade route/coastal district history data.

Appendix H -- cont.

(a) $$TRCDLGT_{t1} = RGLGT_{t1} * (\sum_{\tau=67}^{75} TRCDLGT_{t2} / \sum_{\tau=67}^{75} RGLGT_{t2})$$

Where, t1 = 1976 to 2000
t2 = 1967 to 1975
TRCDLGT = 3-digit trade route by coastal district forecast.
RGLT = 3-digit regional forecast.
TRCDGLGT = Historical series of unique coastal district by trade route by region record.
RGLGT = 3-digit regional history.

Step 2. Aggregate 3-digit coastal district by trade route forecast to trade route forecast.

Step 3. Aggregate 3-digit coastal district by trade route forecast to coastal district forecast.

Appendix I

3-DIGIT CENSUS SCHEDULE A & B CARGO-TYPE ASSIGNMENTS

- SCHEDULE A IMPORTS -

CODE	COMMODITY DESCRIPTION	GENERAL CARGO	DRY BULK	LIQUID BULK
001	LIVE ANIMALS	X		
011	MEAT, FRESH, CHILLED OR FROZEN	X		
012	PORK, DRD, SLTD, SMOKED	X		
013	MEATS IN CONTAINERS, N.E.S.	X		
022	MILK AND CREAM	X		
023	BUT. & CREAM OVER 45% B. FAT	X		
024	CHEESE AND CURD	X		
025	EGGS, BIRDS, ALBUMEN & YOLK	X		
031	FISH,FRESH,OR SIMPLY PRESERVED	X		
032	FISH, AIRTIGHT CONT, N.E.C.	X		
041	WHEAT, UNMILLED	X		
042	RICE INCLUDING PATNA	X		
043	BARLEY, UNMILLED		X	
044	CORN OR MAIZE, UNMILLED	X		
045	CEREALS, UNMILLED, N.E.S.	X		
048	CEREAL AND FLOUR PREPARATIONS	X		
051	FRUITS, FRESH	X		
052	FRUITS, DRIED	X		
053	NUTS & FRUITS, N.E.S.	X		
054	VEGETABLES, FRESH, CHLD, FRZN.	X		
055	VEGETABLES, PRESERVED N.E.S.	X		
061	SUGAR, SYRUPS, MOLASSES, HONEY		X	
062	SUGAR, CONFECTIONERY	X		
071	COFFEE	X		
072	COCOA	X		
073	CHOCOLATE	X		
074	TEA AND MATE	X		
075	SPICES	X		
081	FEEDING-STUFF FOR ANIMALS		X	
091	LARD AND BUTTER SUBST.	X		
099	FOOD PREPARATIONS, N.E.C.	X		
111	NONALCOHOLIC BEVERAGES, N.E.C.	X		
112	ALCOHOLIC BEVERAGES	X		
121	TOBACCO, UNMANUFACTURED	X		
122	TOBACCO MANUFACTURES	X		
211	HIDES & SKINS, UNDRESSED	X		
212	FUR SKINS, UNDRESSED	X		
221	OIL SEEDS, OIL NUTS, KERNELS	X		
231	RUBBER CRUDE	X		
241	FUEL WOOD, CHARCOAL, AND WASTE	X		
242	WOOD, IN THE ROUGH		X	
243	WOOD, SHAPED OR SIMPLY WORKED	X		
244	CORK, NATURAL, RAW AND WASTE	X		
251	PULPS AND WASTE PAPER	X		
261	SILK, RAW	X		
262	WOOL AND OTHER ANIMAL HAIR	X		
263	COTTON	X		
264	JUTE	X		
265	FIBERS, VEGETABLE N.E.S.	X		

Appendix I -- cont.

CODE	COMMODITY DESCRIPTION	GENERAL CARGO	DRY BULK	LIQUID BULK
266	MAN MADE FIBERS	X		
267	WASTE FROM TEXTILE FABRICS	X		
271	FERTILIZERS, CRUDE		X	
273	STONE, SAND, AND GRAVEL		X	
274	SULPHUR AND CRUDE IRON PYRITES		X	
275	NATURAL ABRASIVES, INC. DIAMON	X		
276	CRUDE MINERALS N.E.S.	X		
281	IRON ORE AND CONCENTRATES		X	
282	IRON AND STEEL SCRAP		X	
283	ORES, CONCENTRATES NONFERROUS		X	
284	NONFERROUS METAL SCRAP	X		
285	PLATINUM	X		
286	THORIUM ORES AND CONCENTRATES	X		
291	ANIMAL MATERIALS, NES, CRUDE	X		
292	VEGETABLE MATERIALS NES, CRUDE	X		
321	COAL, COKE AND BRIQUETS		X	
331	PETROLEUM, CRUDE			X
332	PETROLEUM, PRODUCTS			X
341	GAS, NATURAL & MANUFACTURED			X
411	ANIMAL OILS AND FATS N.E.S.	X		
421	FIXED VEGTABLE OILS, SOFT	X		
422	FIXED VEGETABLE OILS, N.E.C.	X		
431	FATTY ACIDS, WAXES, FATS, OILS	X		
512	ORGANIC CHEMICALS	X		
513	INORGANIC CHEMICAL ELEMENTS	X		
514	INORGANIC CHEM.EXCEPT ELEMENTS	X		
515	RADIOACTIVE-STABLE ISOTOPES	X		
521	MINERAL TAR AND TAR OILS	X		
531	SYNTHETIC ORGANIC DYESTUFFS	X		
532	DYEING AND TANNING EXTRACTS	X		
533	PIGMENTS, PAINTS, VARNISH	X		
541	MEDIC AND PHARMAC. PRODUCTS	X		
551	ESSENTIAL OILS, PERFUME.	X		
553	PERFUMES, COSMETICS, DENTIFRIC	X		
554	SOAPS AND POLISHING PREPS.	X		
561	FERTILIZERS, MANUFACTURED		X	
571	EXPLOSIVES & PYROTECHNIC PRO.	X		
581	PLASTIC MATERIALS, SYN. RESINS	X		
599	CHEM. PRODS & MTLS. N.E.C.	X		
611	LEATHER	X		
612	MANUFACTURES OF LEATHER N.E.C.	X		
613	FUR SKINS, DRESSED	X		
629	RUBBER, MFGRS. FINISHED NEC.	X		
631	WOOD VENEERS, PLYWOOD BOARDS	X		
632	WOOD MANUFACTURES, N.E.C.	X		
633	CORK MANUFACTURES	X		
641	PAPER AND PAPERBOARD	X		
642	ARTICLES & PAPER PULP, PAPER	X		
651	TEXTILE YARN AND THREAD	X		
652	COTTON FABRICS, WOVEN	X		
653	TEXTILE FABRICS, WOVEN	X		
654	TULLE, LACE, EMBROIDERY, ETC.	X		
655	SPECIAL TEXTILE FABRICS, INCL	X		
656	MADE-UP ARTICLES, TEXTILE, NEC	X		

Appendix I -- cont.

CODE	COMMODITY DESCRIPTION	GENERAL CARGO	DRY BULK	LIQUID BULK
657	FLOOR COVERING, TAPESTRIES ETC	X		
661	BUILDING MATERIAL, LIME,CEMENT	X		
662	CLAY AND REF. CONSTRU MATERIAL	X		
663	MINERAL MANUFACTURES, N.E.C.	X		
664	GLASS	X		
665	GLASSWARE	X		
666	POTTERY	X		
667	PRECIOUS, SEMI-PRECIOUS STONES	X		
671	PIG IRON	X		
672	IRON OR STEEL PRIMARY FORMS		X	
673	IRON OR STEEL BARS.		X	
674	IRON OR STEEL PLATES & SHEETS		X	
675	HOOP & STRIP OF IRON OR STEEL	X		
676	RAILS OR RAILWAY TRACK MATERIA	X		
677	IRON OR STEEL WIRE, EXCL.	X		
678	IRON OR STEEL TUBES, FITTINGS	X		
679	IRON OR STEEL CASTINGS,FORGING	X		
681	SILVER AND PLATINUM	X		
682	COPPER & COPPER ALLOY	X		
683	NICKEL & NICKEL ALLOYS ETC.	X		
684	ALUMINUM & ALUMINUM ALLOYS	X		
685	LEAD & LEAD ALLOYS	X		
686	ZINC & ZINC ALLOYS	X		
687	TIN & TIN ALLOYS	X		
688	URANIUM & THORIUM METAL	X		
689	NON FERROUS BASE METAL N.E.C	X		
691	FIN.STRUCTURAL METAL PARTS NE	X		
692	METAL CONTAINERS FOR STORAGE	X		
693	WIRE PRO. NON ELECTRIC FENCING	X		
694	NAILS, SCREW, NUTS, BOLTS, ETC	X		
695	HAND AND MACHINE TOOLS	X		
696	TABLE FLATWARE AND CUTLERY	X		
697	HOUSEHOLD EQUIP. OF BASE METAL	X		
698	MANUFACTURES OF METAL, N.E.C.	X		
711	POWER GENERATING MACHINERY	X		
712	AGRICULTURAL MACHINERY, ETC.	X		
714	OFFICE MACHINES AND PARTS	X		
715	METALWORKING MACHINERY & PARTS	X		
717	TEXTILE & LEATHER MACHINERY	X		
718	MACH. FOR SPEC INDUSTR.	X		
719	MACH. & APPLIANCE N.E.C.	X		
722	ELECTRIC POWER MACHINERY	X		
723	EQUIP. FOR DISTRIBUTING ELEC.	X		
724	TELECOMMUNICATIONS APPARATUS	X		
725	ELECTRIC REFRIGERATORS	X		
726	ELECTRIC APPARATUS, MEDICAL	X		
729	ELECTRICAL MACHINERY N.E.S.	X		
731	RAILWAY VEHICLES AND PARTS	X		
732	ROAD MOTOR VEHICLES AND PARTS	X		
733	VECHICLES OTHER THAN ROAD MTR	X		
734	AIRCRAFT AND SPACECRAFT	X		
735	SHIPS,BOATS,FLOATING STRUCT.	X		
812	PLUMB. HEATING, EQUIP LIGHTFIX	X		
821	FURNITURE	X		

Appendix I -- cont.

CODE	COMMODITY DESCRIPTION	GENERAL CARGO	DRY BULK	LIQUID BULK
831	TRAVEL GOODS, HANDBAGS, ETC.	X		
841	CLOTHING, ETC. NOT FUR	X		
842	FUR CLOTHING INCL.	X		
851	FOOTWEAR	X		
861	SCIENTIFIC, MED. APPARAT.N.E.C	X		
862	PHOTOGRAPHIC SUPPLIES, INCL.	X		
863	MOTIONPICTURE,PHOTOFILM N.E.C.	X		
864	WATCHES & CLOCKS PARTS INCL.	X		
891	SOUND RECORDERS AND PARTS	X		
892	PRINTED MATTER	X		
893	PLASTIC MANUFACTURES, N.E.C.	X		
894	BABY CARRIAGES, TOYS, GAMES	X		
895	OFFICE & STATIONERY SUPPLIES	X		
896	WORKS OF ART, ANTIQUES	X		
897	JEWELRY AND RELATED ARTICLES	X		
899	MANUFACTURED ARTICLES, N.E.C.	X		
931	SPEC. TRANSACTIONS NOT CLASS.	X		
941	ANIMALS.LIVE.N.E.C. INCL	X		
951	ARMORED FIGHTING VEHICLES,ARMS	X		
999	ALL OTHER COMMODITIES	X		

Appendix I -- cont.

3-DIGIT CENSUS SCHEDULE A & B CARGO-TYPE ASSIGNMENTS

- SCHEDULE B EXPORTS -

CODE	COMMODITY DESCRIPTION	GENERAL CARGO	DRY BULK	LIQUID BULK
001	LIVE ANIMALS	X		
011	MEAT,FRESH, CHILLED OR FROZEN	X		
012	MEAT, DRIED, SLTED, OR SMOKED	X		
013	MEAT IN CONT, N.E.S.	X		
022	MILK AND CREAM	X		
023	BUTTER AND ANHYDROUS MILK FAT	X		
024	CHEESE AND CURD	X		
025	EGGS, BIRDS, EXCL. EGG ALBUM.	X		
031	FISH,FRESH,OR SIMPLY PRESERVED	X		
032	FISH, AIRTIGHT CONT, N.E.C.	X		
041	WHEAT, UNMILLED		X	
042	RICE		X	
043	BARLEY, UNMILLED		X	
044	CORN OR MAIZE, UNMILLED		X	
045	CEREALS, UNMILLED, N.E.S.		X	
046	WHEAT FLOUR, MEAL, AND GROATS	X		
047	CEREAL FLOUR, MEAL AND GROATS	X		
048	CEREAL AND FLOUR PREPARATIONS	X		
051	FRUITS, FRESH	X		
052	FRUITS, DRIED	X		
053	NUTS & FRUITS, N.E.S.	X		
054	VEGETABLES, FRESH, CHLO, FRZN.	X		
055	VEGETABLES, PRESERVED N.E.S.	X		
061	SUGAR, SYRUPS, MOLASSES, HONEY			X
062	SUGAR, CONFECTIONERY	X		
071	COFFEE	X		
072	COCOA	X		
073	CHOCOLATE	X		
074	TEA AND MATE	X		
075	SPICES	X		
081	FEEDING-STUFF FOR ANIMALS		X	
091	MARGARINE AND EDIBLE FATS	X		
099	FOOD PREPARATIONS, N.E.C.	X		
111	NONALCOHOLIC BEVERAGES, N.E.C.	X		
112	ALCOHOLIC BEVERAGES	X		
121	TOBACCO, UNMANUFACTURED	X		
122	TOBACCO MANUFACTURES	X		
211	HIDES & SKINS, UNDRESSED	X		
212	FUR SKINS, UNDRESSED	X		
221	OIL SEEDS, OIL NUTS, KERNELS		X	
231	RUBBER CRUDE	X		
241	FUEL WOOD,CHARCOAL,AND WASTE	X		
242	WOOD, IN THE ROUGH		X	
243	WOOD, SHAPED OR SIMPLY WORKED	X		
244	CORK, NATURAL, RAW AND WASTE	X		
251	PULPS AND WASTE PAPER	X		
261	SILK, RAW	X		
262	WOOL AND OTHER ANIMAL HAIR	X		
263	COTTON	X		

Appendix I -- cont.

CODE	COMMODITY DESCRIPTION	GENERAL CARGO	DRY BULK	LIQUID BULK
264	JUTE	X		
265	FIBERS, VEGETABLE N.E.S.	X		
266	MAN MADE FIBERS	X		
267	WASTE FROM TEXTILE FABRICS	X		
271	FERTILIZERS, CRUDE		X	
273	STONE, SAND, AND GRAVEL		X	
274	SULPHUR AND CRUDE IRON PYRITES		X	
275	NATURAL ABRASIVES, INC. DIAMON	X		
276	CRUDE MINERALS N.E.S.	X		
281	IRON ORE AND CONCENTRATES		X	
282	IRON AND STEEL SCRAP		X	
283	ORES, CONCENTRATES NONFERROUS		X	
284	NONFERROUS METAL SCRAP	X		
285	PLATINUM	X		
286	URANIUM,THORIUM ORES & CONS.	X		
291	ANIMAL MATERIALS, NES, CRUDE	X		
292	VEGETABLE MATERIALS NES, CRUDE	X		
321	COAL, COKE AND BRIQUETS		X	
331	PETROLEUM, CRUDE			X
332	PETROLEUM, PRODUCTS		X	
341	GAS, NATURAL & MANUFACTURED			X
411	ANIMAL OILS AND FATS N.E.S.	X		
421	FIXED VEGETABLE OILS, SOFT	X		
422	FIXED VEGETABLE OILS,N.E.C.	X		
431	FATTY ACIDS,WAXES,FATS,OILS	X		
512	ORGANIC CHEMICALS	X		
513	INORGANIC CHEMICAL ELEMENTS	X		
514	INORGANIC CHEM.EXCEPT ELEMENTS	X		
515	RADIOACTIVE & STABLE ISOTOPES	X		
521	MINERAL TAR AND TAR OILS	X		
531	SYNTHETIC ORGANIC DYESTUFFS	X		
532	DYEING AND TANNING EXTRACTS	X		
533	PIGMENTS, PAINTS, VARNISH	X		
541	MEDIC AND PHARMAC. PRODUCTS	X		
551	ESSENTIAL OILS, PERFUME,	X		
553	PERFUMES,COSMETICS,DENTIFRICES	X		
554	SOAPS AND POLISHING PREPS.	X		
561	FERTILIZERS, MANUFACTURED		X	
571	EXPLOSIVES & PYROTECHNIC PRO.	X		
581	PLASTIC MATERIALS, SYN. RESINS	X		
599	CHEM. PRODS & MTLS. N.E.C.	X		
611	LEATHER	X		
612	MANUFACTURES OF LEATHER N.E.C.	X		
613	FUR SKINS, DRESSED	X		
621	RUBBER MANUFACTURES,UNVULCANIZ	X		
629	RUBBER, MFGRS. FINISHED NEC.	X		
631	WOOD VENEERS, PLYWOOD BOARDS	X		
632	WOOD MANUFACTURES, N.E.C.	X		
633	CORK MANUFACTURES	X		
641	PAPER AND PAPERBOARD	X		
642	ARTICLES & PAPER PULP, PAPER	X		
651	TEXTILE YARN AND THREAD	X		
652	COTTON FABRICS, WOVEN	X		
653	TEXTILE FABRICS, WOVEN	X		

Appendix I -- cont.

CODE	COMMODITY DESCRIPTION	GENERAL CARGO	DRY BULK	LIQUID BULK
654	TULLE, LACE, EMBROIDERY, ETC.	X		
655	SPECIAL TEXTILE FABRICS, INCL	X		
656	MADE-UP ARTICLES, TEXTILE, NEC	X		
657	FLOOR COVERING, TAPESTRIES ETC	X		
661	BUILDING MATERIAL, LIME,CEMENT	X		
662	CLAY AND REF. CONSTRU MATERIAL	X		
663	MINERAL MANUFACTURES, N.E.C.	X		
664	GLASS	X		
665	GLASSWARE	X		
666	POTTERY	X		
667	PRECIOUS, SEMI-PRECIOUS STONES	X		
671	PIG IRON	X		
672	IRON OR STEEL PRIMARY FORMS		X	
673	IRON OR STEEL BARS.		X	
674	IRON OR STEEL PLATES & SHEETS		X	
675	HOOP & STRIP OF IRON OR STEEL	X		
676	RAILS OR RAILWAY TRACK MATERIA	X		
677	IRON OR STEEL WIRE, EXCL.	X		
678	IRON OR STEEL TUBES, FITTINGS	X		
679	IRON OR STEEL CASTINGS,FORGING	X		
681	SILVER AND PLATINUM	X		
682	COPPER & COPPER ALLOY	X		
683	NICKEL & NICKEL ALLOYS ETC.	X		
684	ALUMINUM & ALUMINUM ALLOYS	X		
685	LEAD & LEAD ALLOYS	X		
686	ZINC & ZINC ALLOYS	X		
687	TIN & TIN ALLOYS	X		
688	URANIUM & THORIUM METAL	X		
689	NON FERROUS BASE METAL N.E.C.	X		
691	FIN. STRUCTURAL METAL PARTS NE	X		
692	METAL CONTAINERS FOR STORAGE	X		
693	WIRE PRO. NON ELECTRIC FENCING	X		
694	NAILS, SCREW, NUTS, BOLTS, ETC	X		
695	HAND AND MACHINE TOOLS	X		
696	TABLE FLATWARE AND CUTLERY	X		
697	HOUSEHOLD EQUIP. OF BASE METAL	X		
698	MANUFACTURES OF METAL, N.E.C.	X		
711	POWER GENERATING MACHINERY	X		
712	AGRICULTURAL MACHINERY, ETC.	X		
714	OFFICE MACHINES AND PARTS	X		
715	METALWORKING MACHINERY & PARTS	X		
717	TEXTILE & LEATHER MACHINERY	X		
718	MACH. FOR SPEC INDUSTR.	X		
719	MACH. & APPLIANCE N.E.C.	X		
722	ELECTRIC POWER MACHINERY	X		
723	EQUIP. FOR DISTRIBUTING ELEC.	X		
724	TELECOMMUNICATIONS APPARATUS	X		
725	ELECTRIC REFRIGERATORS	X		
726	ELECTRIC APPARATUS, MEDICAL	X		
729	ELECTRICAL MACHINERY N.E.S	X		
731	RAILWAY VEHICLES AND PARTS	X		
732	ROAD MOTOR VEHICLES AND PARTS	X		
733	VECHICLES OTHER THAN ROAD MTR	X		
734	AIRCRAFT AND SPACECRAFT	X		

Appendix I -- cont.

CODE	COMMODITY DESCRIPTION	GENERAL CARGO	DRY BULK	LIQUID BULK
735	SHIPS,BOATS,FLOATING STRUCT.	X		
812	PLUMB. HEATING, EQUIP LIGHTFIX	X		
821	FURNITURE	X		
831	TRAVEL GOODS, HANDBAGS, ETC.	X		
841	CLOTHING, ETC. NOT FUR	X		
842	FUR CLOTHING INCL.	X		
851	FOOTWEAR	X		
861	SCIENTIFIC, MED. APPARAT.N.E.C	X		
862	PHOTOGRAPHIC SUPPLIES, INCL.	X		
863	MOTIONPICTURE,PHOTOFILM N.E.C.	X		
864	WATCHES & CLOCKS PARTS INCL.	X		
891	SOUND RECORDERS AND PARTS	X		
892	PRINTED MATTER	X		
893	PLASTIC MANUFACTURES, N.E.C.	X		
894	BABY CARRIAGES, TOYS, GAMES	X		
895	OFFICE & STATIONERY SUPPLIES	X		
896	WORKS OF ART, ANTIQUES	X		
897	JEWELRY AND RELATED ARTICLES	X		
899	MANUFACTURED ARTICLES, N.E.C.	X		
931	SPEC. TRANSACTIONS NOT CLASS.	X		
941	ANIMALS.LIVE.N.E.C. INCL	X		
951	ARMORED FIGHTING VEHICLES,ARMS	X		
952	MILITARY APPAREL AND FOOTWEAR	X		
961	COIN, OTHER THAN GOLD	X		
999	ALL OTHER COMMODITIES	X		

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